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Maintenance of the Organic Chemical Producers Data Base

Radian Corp.
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MAINTENANCE OF THE ORGANIC CHEMICAL PRODUCERS DATA BASE

by

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16. ABSTRACT

This report describes the maintenance and operation of the Organic Chemical Producers Data Base (OCPDB) from March 1979 to December 1980. During this period the OCPDB, an automated chemical information system developed for the U.S. Environmental Protection Agency, was expanded and updated by Radian Corporation. Concurrently, the data base provided users with economic, toxicity, use, and production information about more than 600 industrial organic chemical products.

During the 1979-1980 maintenance task, the list of OCPDB chemical products was expanded to more than 600 from the 590 contained in the previous version of the OCPDB. Fifteen individual chemical, plastic, resin, and fiber products replaced six less-specific product groups.

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FOREWORD

When energy and material resources are extracted, processed, converted, and used, the related pollutional impacts on our environment and even on our health often require that new and increasingly more efficient pollution control methods be used. The Industrial Environmental Research Laboratory -Cincinnati (IERL-Ci) assists in developing and demonstrating new and improved methodologies that will meet these needs both efficiently and economically.

The Organic Chemical Producers Data Base (OCPDB) was developed to provide easy access to data on organic chemicals and their production. It provides a wide range of report capabilities on chemical-related data such as uses, toxicity and production processes; economic data such as production volume and sales; and producer-related data such as company names and plant locations.

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ABSTRACT

This report describes the maintenance and operation of the Organic Chemical Producers Data Base (OCPDB) from March 1979 to December 1980. During this period the OCPDB, an automated chemical information system developed for the U.S. Environmental Protection Agency, was expanded and updated by Radian Corporation. Concurrently, the data base provided users with economic, toxicity, use, and production information about over 600 industrial organic chemical products.

During the 1979-1980 maintenance task, the list of OCPDB chemical products was expanded to more than 600 from the 590 contained in the previous version of the OCPDB. Fifteen individual chemical, plastic, resin, and fiber products replaced six less-specific product groups.

A chemical-related file containing emission factor data was included for about 20 percent of the OCPDB chemicals. Both qualitative and quantitative emissions data were incorporated into this file.

Data files previously developed for the OCPDB were updated if more recent information was available. The most extensive update effort was directed toward producer-related files containing producer names, locations, parent companies, USGS river basins, and product slates.

An extensive quality assurance plan was developed for the OCPDB. It included manual and automated quality assurance procedures for data input, data output, and report generation.

Several standard report formats were designed to retrieve and display OCPDB information. In these reports, data were assessed by both chemical and producer identification keys.

The mechanics of the OCPDB remain the same as those described in The Revised Organic Chemical Producers Data Base System. The data base was implemented and maintained through the System 2000® data base management system offered by Boeing Computer Services in Seattle, Washington.

This report was submitted in fulfillment of Contract No. 68-03-2776, Work Effort 2 by Radian Corporation under the sponsorship of the U.S. Environmental Protection Agency.

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SECTION 1

INTRODUCTION

This report describes the activities conducted during Radian's operation and maintenance of the Organic Chemical Producers Data Base (OCPDB) under EPA Contract 68-03-2776, Work Effort 2, which extended from March 1979 to December 1980.

The OCPDB, an automated chemical information system, was originally developed by Radian in 1976 for the U.S. Environmental Protection Agency's Industrial Environmental Research Laboratory in Cincinnati. In providing easy access to organic chemical data in an efficient, systematic manner, the OCPDB served as a tool for understanding the organic chemical industry and for guiding EPA work.

In February 1979 Radian completed a task to revise and update the original OCPDB and increase the size and capabilities of the system. In this effort, the data base was expanded to include almost 600 chemical entries. New data describing chemicals were added: Chemical Abstract Services (CAS) registry numbers, process descriptions, additional toxicity data, use descriptions, sales, and synonyms. Parent company and river basin identification were added to the producer files. Additionally, files from the 1976 version of the OCPDB were updated where new data had become available.

The OCPDB was implemented with System 2000® in March 1979. This data base management system gave the OCPDB increased capabilities, flexibility, and efficiency. System 2000® enables data base users to access the OCPDB by either interactive or batch mode and allows direct retrieval of information.

This report reviews the structure and capabilities of the OCPDB and describes changes made to the data base during a two-year maintenance period ending in December 1980. Section 2 is a summary provided for those who want a quick overview of data base alterations and maintenance activities. Section 3 describes the status of each OCPDB file and outlines the changes which took place during this task. New files and chemicals

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added during the task are described in detail. System mechanics and structure are summarized in Section 4. Discussed in Section 5 is the OCPDB quality assurance program. Section 6 contains a discussion of several of the most useful OCPDB reports generated during the maintenance task. These reports demonstrate many of the OCPDB's data storage and retrieval capabilities. A description of two special reports prepared during this work effort illustrates some of the data base's powerful analytical capabilities.

A list of OCPDB chemicals, with CAS numbers and process descriptions, is provided in Appendix A. OCPDB chemicals included in EPA's study of the synthetic organic chemical manufacturing industry (SOCMI) are marked with a "•" on the list. Appendix B contains the OCPDB definition in System 2000®.

SECTION 2

SUMMARY

In work conducted during EPA Contract No. 68-03-2776, Work Effort 2, the OCPDB was expanded, updated, and maintained. Concurrently, report formats were developed which utilized OCPDB capabilities to best meet users' needs.

The list of chemical products included in the OCPDB was expanded to more than 600 from the 390 contained in the previous version described in The Revised Organic Chemical Producers Data Base System (15). Fifteen individual chemical, plastic, resin, and fiber products replaced six less-specific product groups contained in the previous version of the OCPDB. Available chemical- and producer-related information was included for each new chemical product entry.

A chemical-related data file containing emission factors was added to the OCPDB. Emission factor data were included for about 20 percent of the OCPDB chemicals. These data, obtained from Monsanto Research Corporation's Source Assessment work for EPA, added both qualitative and quantitative information to the data base (3).

Table 1 lists the data files included in the OCPDB at the end of this maintenance task. Also shown are the number of unique data items, the total number of occurrences of data items within each file, and the amount of computer storage required.

Data files developed for the previous OCPDB were updated if more recent data were available. The most extensive update effort was directed toward producer-related files, although more current chemical-related data were added whenever possible.

The mechanics of the OCPDB remain the same as those described in Reference 15. The data base was implemented and maintained through the System 2000® data base management system offered by Boeing Computer Services in Seattle, Washington.

An extensive quality assurance (QA) plan was developed for the OCPDB as a part of the work effort. The plan provided quality assurance for the data base as it was originally implemented and included QA procedures for data input and report

TABLE 1. DATA TALLY FOR THE OCPDB[a]

	No. of Unique Values	No. of Occurrences	Total Computer Storage Volume in No. of Bytes
Entry Type	2	1,994	1,994
Entry ID	1,676	1,994	8,944
Chemical Related Data			
OCPDB Chemicals	605	605	15,125
CAS Numbers	530	533	5,330
New Chemical Markers	1	231	231
Priority Pollutant Markers	1	135	135
Wiswesser Line Notation	495	498	19,920
Process ID	8	1,160	2,316
Process Description	648	1,160	29,000
IPPEU Numbers	286	407	1,221
Use Description	1,794	2,763	138,150
Use Volume	b	784	6,272
Use by % of Consumption	b	711	4,266
Use IPPEU Numbers	85	99	297
Emission Description	136	469	3,752
Emission Rating	4	459	1,407
Toxicity Data			
NIOSH Registry Number	b	439	3,512
LD_{50} Mode	6	326	978
LD_{50} Species	6	326	978
LD_{50} Amount	b	326	2,608
LD_{50} Units	4	580	5,800
$LC_{\ell o}$ Mode	3	130	390
$LC_{\ell o}$ Species	10	130	390
$LC_{\ell o}$ Amount	b	130	1,040
$LC_{\ell o}$ Units	38	578	5,780
AQTX	b	170	2,496
TLV	b	185	1,850
TLV Units	3	570	5,700
Sax Ratings	b	1,470	1,470
Economic Data			
Year	15	702	1,404
Production Volume	b	287	2,296
Unit Cost	b	348	2,784
Sales	b	176	1,408

(Continued)

[a]As of 31 December 1980.

[b]For non-key data files, the number of unique values is not known.

TABLE 1. DATA TALLY FOR THE OCPDB[a] (Continued)

	No. of Unique Values	No. of Occurrences	Total Computer Storage Volume in No. of Bytes
Producer Related Data			
Plant ID	1,341	3,803	19,015
Plant Capacity	289	1,272	11,448
Company Names	644	1,389	34,725
Cities	769	1,389	27,780
States	49	1,389	2,778
River Basin	337	1,116	33,480
River Basin Code	336	1,116	8,928
Parent Companies	199	372	9,300
TOTALS	15,527	38,049	639,828[c]

[a]As of 31 December 1980.

[c]With indices and other internal data base tables, the total number for the entire data base is greater than 2,000,000 bytes.

generation. Backup measures were developed to protect the integrity of OCPDB information while the data base was loaded on System 2000®.

Several standard report formats were designed to retrieve and display information in a manner most useful to data base users. In these reports, data were accessed by both chemical entry identification and producer entry identification. Example reports are shown in Section 6.

At times, more complex data reporting or analysis requirements made generation of unique, specialized analytical reports necessary. Analytical capabilities of the OCPDB were coupled with the data base's ability to interface with other data handling systems to complete these reports.

SECTION 3

DESCRIPTION OF DATA FILES

The structure of the OCPDB data files was not changed significantly throughout the maintenance task described in this report. However, a file containing process-specific emission factor data for approximately 20 percent of the OCPDB chemicals was added to the data base. Additionally, the list of chemical products included in the OCPDB was expanded as fifteen individual chemical, plastic, resin, and fiber products replaced six product groups previously contained in the data base.

Information contained in several files was updated to reflect data reported in mid-1979. Files which were updated included those containing economic data (production volume, unit cost, and sales), and plant product slate and capacity data. Producing plants, parent companies, and processes were deleted or added to better reflect OCPDB chemicals' current production status. More specific process and river basin information was obtained for some chemicals from available literature. Additional sources, used in the 1979 revision of the OCPDB, are listed in The Revised Organic Chemical Producers Data Base System (15).

This section describes the status of both chemical- and producer-related OCPDB data files at the end of this task. To assist readers unfamiliar with the OCPDB, a detailed description of the files, similar to that contained in Reference 15, has been included.

CHEMICAL-RELATED DATA

The list of chemicals in the OCPDB was compiled from four main sources: the original OCPDB (1976), the priority pollutant list which resulted from Natural Resources Defence Council (NRDC) versus Train (8), a list of additions requested by EPA's Office of Air Quality Planning and Standards (OAQPS) (4), and a list of chemicals included in the data base compiled by Catalytic, Inc. (2). During the 1979-1980 maintenance task, the OCPDB chemical list was refined to more accurately describe several product groups included in the data base. As a result, six product groups were replaced by fifteen more specific entries for chemical, plastic, resin, and fiber products. Table 2 lists the

TABLE 2. DELETIONS/ADDITIONS TO THE LIST OF OCPDB CHEMICALS

1979 OCPDB CHEMICAL		REPLACEMENT OCPDB CHEMICAL	
Chemical ID No.	Chemical Name	Chemical ID No.	Chemical Name
10	ABS/SAN	5	ABS
		3235	SAN
160	Acrylic acid and acrylate esters	162	Acrylic acid
		164	Acrylate esters
2825	Nylon	2821	Nylon 6
		2822	Nylon 66
		2823	Nylon 69
		2824	Nylon 11
		2825	Nylon 12
		2826	Nylon 612
3006	Polyester resin/ fiber	3005	Polyethylene terephthalate
3008	Polyethylene and copolymers	3007	High density polyethylene
		3009	Low density polyethylene
3048	Polyvinyl chloride and copolymers	3047	Polyvinyl chloride
		3049	PVC copolymers

additions and deletions made to the OCPDB chemical list during this task. A complete list of current OCPDB chemicals and processes is included in Appendix A.

Data describing the chemical products included in the OCPDB consist of toxicity, unit price, U.S. production value, sales, Chemical Abstract Service (CAS) registry number, Wiswesser Line Notation, concise process descriptions, Industrial Process Profiles for Environmental Use (IPPEU) process numbers, uses, and synonyms. Units in which each data item is expressed are shown in Table 3.

TABLE 3. OCPDB DATA FILE UNITS

DATA FILE	UNITS
Toxicity, LD_{50}	Micrograms/kilogram (MICRO-GM/KG)
	Milligrams/kilogram (MG/KG)
	Grams/kilogram (GM/KG)
	Kilograms/kilogram (KG/KG)
Toxicity, LC_{lo}	Parts per hundred/unit time (minute or hour) (PPH/M or PPH/H)
	Parts per million/unit time (PPM/M or H)
Toxicity, AQTX	Parts per million (PPM)/96-hour static or continuous flow
Toxicity, TLV	Parts per million (PPM)
	Milligrams per kilogram (MG/KG)
	Milligrams per cubic meter (MG/M^3)
End Use, Amount	Millions of pounds per year (MMLBS/YR)
Economic Data, Volume	Millions of pounds per year (MMLBS/YR)
Economic Data, Sales	Millions of dollars per year (MM$/YR)
Economic Data, Unit Cost	Dollars per pound ($/LB)
Emission Factors, Amount	Pounds per ton product (LBS/TON)
Producing Plants, Capacity	Millions of pounds per year (MMLBS/YR)

Each OCPDB chemical-related file is described in the following paragraphs. The numbered items in the text [X] refer to examples shown in Figure 1.

Chemical Numbers and Identifiers

Each OCPDB chemical has been assigned a unique identification (ID) number through which all chemical-related data are linked to each chemical [1]. The ID numbers were assigned alphabetically and were correlated with the numbers assigned by Catalytic, Inc. to chemical process data compiled for the Effluent Guidelines Division of EPA (2).

In OCPDB reports, chemical names are preceded with a symbol "X" if they are not one of the group of original (1976) OCPDB chemicals [2]. In the example shown in Figure 1, this space is left blank because acrylonitrile is an original OCPDB chemical. A "P" precedes those chemicals which are priority pollutants listed in the consent decree resulting from NRDC vs. Train [3] (8).

Chemical Abstracts Services Registry Number

Chemical Abstracts Services (CAS) Registry Numbers have been included for most of the OCPDB chemicals [4]. These numbers are widely used to identify chemicals, thereby reducing problems of chemical nomenclature systems.

Wiswesser Line Notation

Approximately 95 percent of the OCPDB chemicals have been assigned Wiswesser Line Notation (WLN) codes. WLN is a line formula chemical notation which describes the structural formula of a chemical compound in a series of letters and numbers [5]. Including WLN in the OCPDB has allowed automated retrieval of chemicals by structure and provided functional group searching capabilities.

Synonyms

Incorporating synonyms into the OCPDB has permitted access to chemicals through their synonymous names [6]. Synonyms included cover various chemical nomenclature systems as well as trade, commercial, and foreign names.

ORGANIC CHEMICAL PRODUCERS DATA BASE

PRODUCT DATA REPORT--NATIONWIDE

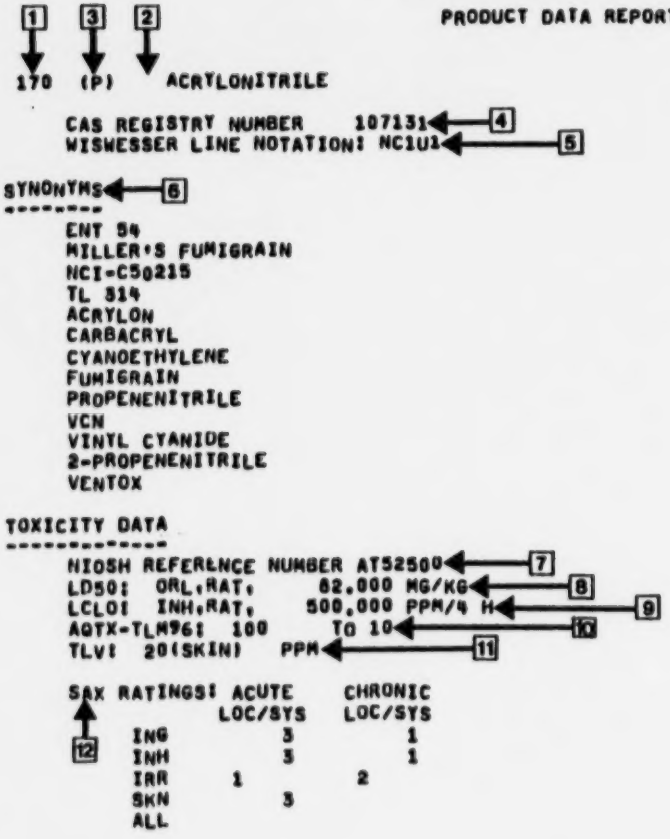


Figure 1. Report format illustrating OCPDB data files.

(Continued)

ORGANIC CHEMICAL PRODUCERS DATA BASE

PRODUCT DATA REPORT--NATIONWIDE

END USES

	AMOUNT (MMLBS/YR) [15]	% DOM. [16]	IPPEU [13]
ABS & SAN PLASTICS [14]	300.000	20.000	
ACRYLIC & MODACRYLIC FIBERS	790.000	55.000	
EXPORTS	100.000	7.000	
MISC.	190.000	13.000	
NITRILE RUBBER	70.000	5.000	

ECONOMIC DATA [17]

YEAR	VOLUME (MMLBS/YR)	SALES (MM$/YR)	UNIT COST ($/LB)
72		50.600	
77	1640.000		
79			.260

PROCESS DESCRIPTION

[18] → 51 AMMOXIDATION OF PROPYLENE
IPPEU 274 [13]

EMISSION FACTORS

DESCRIPTION [19]	RATING	AMOUNT (LBS/TON) [20]
BUTANE	A	.120000
ALLYL ALCOHOL	A	.048000
SO2	A	.035000
NOX	A	1.100000
CO [21]	A	158.600000
METHANE	A	1.340000
ETHANE	A	3.860000
ETHYLENE	A	5.140000
PROPANE	A	44.000000
PROPYLENE	A	66.000000
BUTENE	A	.800000
METHANOL	A	.320000

Figure 1 (Continued)

ORGANIC CHEMICAL PRODUCERS DATA BASE

PRODUCT DATA REPORT--NATIONWIDE

PENTANE	A	.080000
ACETALDEHYDE	A	.120000
HEXANE	A	.080000
ETHANOL	A	.200000
BENZENE	A	.400000
TOLUENE	A	.140000
ACRYLONITRILE	A	1.610000
ACETONITRILE	A	1.374000
HYDROGEN CYANIDE	A	1.480000
FUMARONITRILE	A	.036000
PYRIDINE	A	5.160000
PROPIONALDEHYDE	A	.012200
FURAN	A	.934000
AMMONIA	A	.000012

PRODUCING PLANTS

610	AMERICAN CYANAMID CO. NEW ORLEANS EASTERN LOUISIANA COASTAL		LA 8090203	265.000 MMLBS./YR.
3680	E. I. DU PONT DE NEMOURS & CO., INC. MEMPHIS		TN	270.000 MMLBS./YR.
3690	E. I. DU PONT DE NEMOURS & CO., INC. BEAUMONT LOWER NECHES		TX 12020003	350.000 MMLBS./YR.
7200	MONSANTO CO. CHOCOLATE BAYOU WEST GALVESTON BAY		TX 12040204	440.000 MMLBS./YR.
7210	MONSANTO CO. TEXAS CITY WEST GALVESTON BAY		TX 12040204	420.000 MMLBS./YR.

Figure 1 (Continued)

Toxicity

The OCPDB contains several types of toxicity information. NIOSH registry numbers, consisting of two alphabetical characters followed by five numerical characters, have been included when available [7]. Additional categories of toxicity information include:

- Lethal Dose Fifty Percent (LD_{50})
- Lethal Concentration Low (LC_{Lo})
- Aquatic Toxicity (AQTX)
- Threshold Limit Values (TLV's)
- Toxicity Hazard Rating

LD_{50}s (the lowest dose required to kill 50 percent of a test population) are measures of toxicity requiring knowledge and experience to interpret accurately. The LD_{50} information in the OCPDB specifies the dosage used, the mode of entry, and the experimental animal used [8]. Data for rats were used when a choice was available; in some cases it was necessary to use mouse and guinea pig data.

LC_{Lo} specifies the lowest concentration of a substance in air which has caused death in humans or animals. As with LD_{50} information, the experimental animal, mode of entry and dosage are specified for each chemical [9].

Aquatic toxicity ratings are used to indicate toxicities of substances to aquatic life, an important consideration in assessing water pollution. The format for this entry is "AQTX:TLM 96," where TLM 96 is defined as the 96-hour static or continuous flow standard protocol. The toxic concentrations (in ppm) for the AQTX data are specified, where possible [10].

Threshold Limit Values (TLV's) are reported for each chemical, when possible, in units of parts per million, milligrams per kilogram, or milligrams per cubic meter [11]. The TLV is an upper limit or time weighted average of a concentration recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) for control of occupational exposures. The TLV may be followed by a notation indicating potential hazard from exposure to skin.

The remaining toxicity information [12] consists of Toxicity Hazards Ratings from Sax, Dangerous Properties of Industrial Materials (11). A thorough description of these ratings may be found in both Sax and The Revised Organic Chemical Data Base System (15).

Industrial Process Profiles for Environmental Use

The Industrial Process Profiles for Environmental Use (IPPEU) is a multivolume collection of information concerning industrial processing and environmental impact (9). Each chapter contains information about one specific industry in a series of numbered process descriptions; Chapter 6 is "The Industrial Organic Chemicals Industry." IPPEU process numbers have been assigned to OCPDB process descriptions to provide a cross reference to the document and thus direct the data base user to a complete process description in Chapter 6. IPPEU process numbers also have been assigned to chemical products in the use files when processes for their manufacture are included in Chapter 6 [13].

End Uses

In addition to IPPEU process numbers, OCPDB use files contain both qualitative and quantitative use data for a given chemical. These data include a description of the chemical's specific use [14], the amount of chemical used in a particular application [15], and the percentage of a chemical's domestic production consumed in each use [16].

Economic Data

OCPDB economic information includes overall U.S. industry chemical production volume, unit cost, and sales [17]. These data were updated to reflect mid-1979 values. The principal source of more current information was a July 1979 issue of "Chemical Marketing Reporter" (6). No attempt was made to calculate total U.S. sales from other values. Sales data were not considered equal to production and consumption values, because these values do not account for imports, exports, and changes in stocks.

Process Description

OCPDB process descriptions are short, one-line summaries of industrial processing methods. Laboratory or bench-scale methods have not been included.

Process description code numbers arbitrarily have been assigned for each chemical, beginning with the number 51 [18]. A "Process 0" description indicates that available references did not specify a particular process.

A review of the references listed at the end of this report indicated that a small portion of process information contained in the OCPDB, as it was defined in early 1979, needed to be revised. Thus, process descriptions for a few OCPDB chemicals were changed to reflect mid-1979 information.

Emission Factors

Emission factor data were added to the OCPDB in May 1979. The data, which apply to approximately 20 percent of the OCPDB chemicals, were obtained from the Source Assessment Program conducted for EPA-OAQPS by Monsanto Research Corporation (3).

The emission factor file consists of three parts. The first is a list of chemical species emitted during a particular process [19]. In the second part [20], amounts of pollutants emitted are given in pounds per ton of product.

In the third part, the level of uncertainty associated with each source type is expressed by an emission factor rating [21]. Monsanto defined these ratings as follows (3).

- A - Adequate data of reasonable accuracy
- B - Partly estimated data of indeterminate accuracy
- C - Totally estimated data of indeterminate accuracy
- D - Missing data on known emissions of toxic substances

PRODUCER-RELATED DATA

When this maintenance task began, the OCPDB contained information about more than 1200 organic chemical producers, each of which had been assigned a unique plant identification number [22]. The OCPDB chemicals produced by each producer were listed as a product slate. The product slates listed were restricted to each plant's OCPDB chemical products. Producers were further described with geographic location, annual production capacity, processes used, and parent company name. These files, and the changes made to them during the maintenance period, are described below.

Production, Process, and Capacity

When possible, the process or processes used to produce an OCPDB chemical at a particular plant have been identified. Figure 1 illustrates how plants and processes are linked. In the example shown, all OCPDB plants are listed as producing acrylonitrile through Process 51, ammoxidation of propylene [18].

Process-specific production capacities, when available, have also been included in the OCPDB [23]. If specific processes could not be identified for chemicals and their producers, plants and capacities have been listed under Process 0, Unspecified.

OCPDB producer, process description, and capacity files were updated as a part of this maintenance effort to reflect mid-1979 information. The principal information source used for the update was the 1979 Directory of Chemical Producers (12). More than 1300 plants were listed as OCPDB producers at the task's end.

Geographic Location

The OCPDB includes geographic locations of each producer. Plant location is described by city and state [24]. Each plant's EPA region number is also stored in the data base.

The U.S. Geological Survey (USGS) river basin in which a plant is located is presented for most producers. River basins and their associated USGS codes have been determined to the sub-region level [25].

Sources consulted during the maintenance period provided river basin information about a number of plants not previously assigned a river basin designation (10, 14). Those plants for which a river basin has not been identified are either located in a multiple-river basin area or in a city which could not be identified on maps consulted.

SECTION 4

OCPDB MECHANICS

The OCPDB was implemented in February 1979 through System 2000®, a data base management system (DBMS) which offered programming flexibility and excellent capabilities for retrieving, reporting, and analyzing data. Implementation through this DBMS continued throughout the maintenance task. System 2000® is available through a number of time-sharing services. Throughout the maintenance task, a time-sharing service provided by Boeing Computer Services in Seattle, Washington, was utilized.

A major reason for choosing System 2000® was its widespread availability, which proved to be an important consideration when EPA chose, in December 1980, to transfer the data base to the National Computer Center (NCC) in Research Triangle Park, North Carolina. System 2000®'s availability at NCC, combined with its widespread use throughout EPA, facilitated a smooth, efficient transfer.

The mechanics of the OCPDB were not altered during this maintenance task. Programming activities required by the maintenance task were minimal. A basic set of retrieval programs was developed to meet the needs of OCPDB information requestors. Additionally, efficient update programming was designed, and automated quality assurance procedures (described in Section 5) were developed.

This section reviews the structure, mechanics, and information retrieval capabilities of the OCPDB as described previously in The Revised Organic Chemical Producers Data Base System (15).

SYSTEM STRUCTURE

The OCPDB, as implemented under System 2000®, is organized into two types of entries with a link between them. The two types of entries are those relating to chemical products and those relating to producing plants. Figures 2 and 3 illustrate the hierarchical structures of these two types of entries. Within these entries, data are organized into a logical hierarchy. Hierarchical levels are numbered from zero (the level of the entry), increasing as shown in the figures.

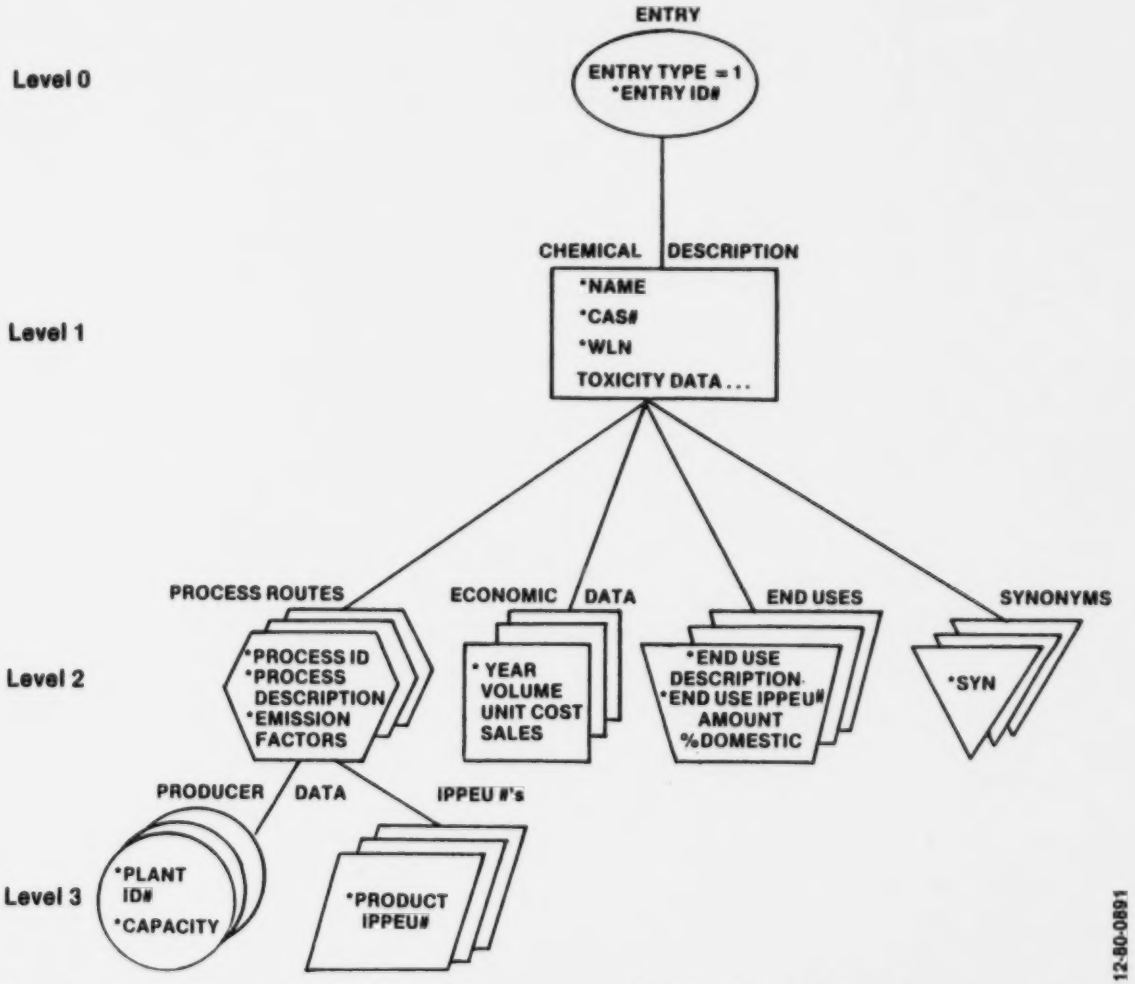
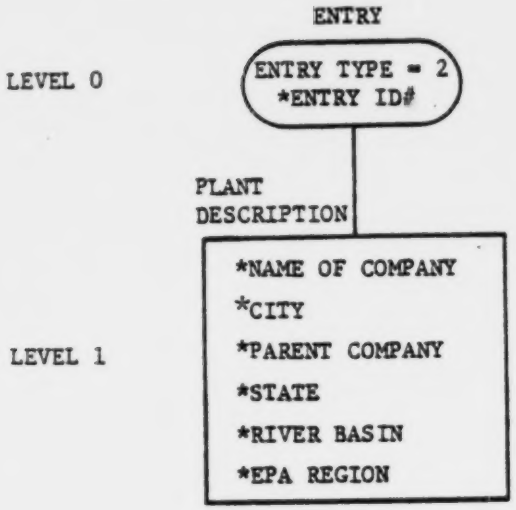


Figure 2. Hierarchical structure of OCPDB chemical product entries. *Indicates Key (searchable) Data Elements



*Indicates Key Data Element

Figure 3. Hierarchical structure of the producing plant entries in the OCPDB.

In the OCPDB hierarchy, the Level 0 contains only two data elements: a unique identifier assigned by Radian for the entry and a type indicator, to distinguish chemical products from producers. Below the top level, the structures of the two types of entries differ considerably.

Each chemical product entry contains up to three additional levels of data (see Figure 2). Level 1 contains descriptive and identifying data, including toxicity data. Several repeating groups (groups of data elements which may occur more than once within the same type of entry, usually with different values in the data elements) occur at Level 2. Production process routes are described by a searchable numeric identifier as well as descriptive title.

The remaining Level 2 repeating groups provide data about U.S. production volume, domestic sales, and unit cost; descriptions of end uses; and synonyms for the primary chemical name used in Level 1.

Associated with each process are two lower level (Level 3) repeating groups. The first lists all plants which produce the chemical described using the process described. The other lists IPPEU numbers associated with the described process. The producing plant is identified by its unique OCPDB identification number. This link between production processes and producers ties together the two types of entries, allowing cross references between producers and products as shown diagrammatically in Figure 4.

The structure of the logical entries describing producing plants (shown in Figure 3) is much simpler than the chemical entry structure. In addition to the top level, Level 9, there is only one other level; it contains the company name, parent company name, city, state, river basin, and EPA region. All of these data elements are key (searchable) items.

The hierarchical structure described above is called the OCPDB definition. A copy of the OCPDB definition as it existed at the end of this maintenance task is included in Appendix B.

INFORMATION RETRIEVAL

Any data element defined in System 2000® as a key data element can be used as the basis for retrieving information from the OCPDB. Key data elements in the revised OCPDB are listed in Table 4.

Three types of direct retrieval are possible with the OCPDB: (1) information about chemical products, (2) information about producers, and (3) relationships between producers and products.

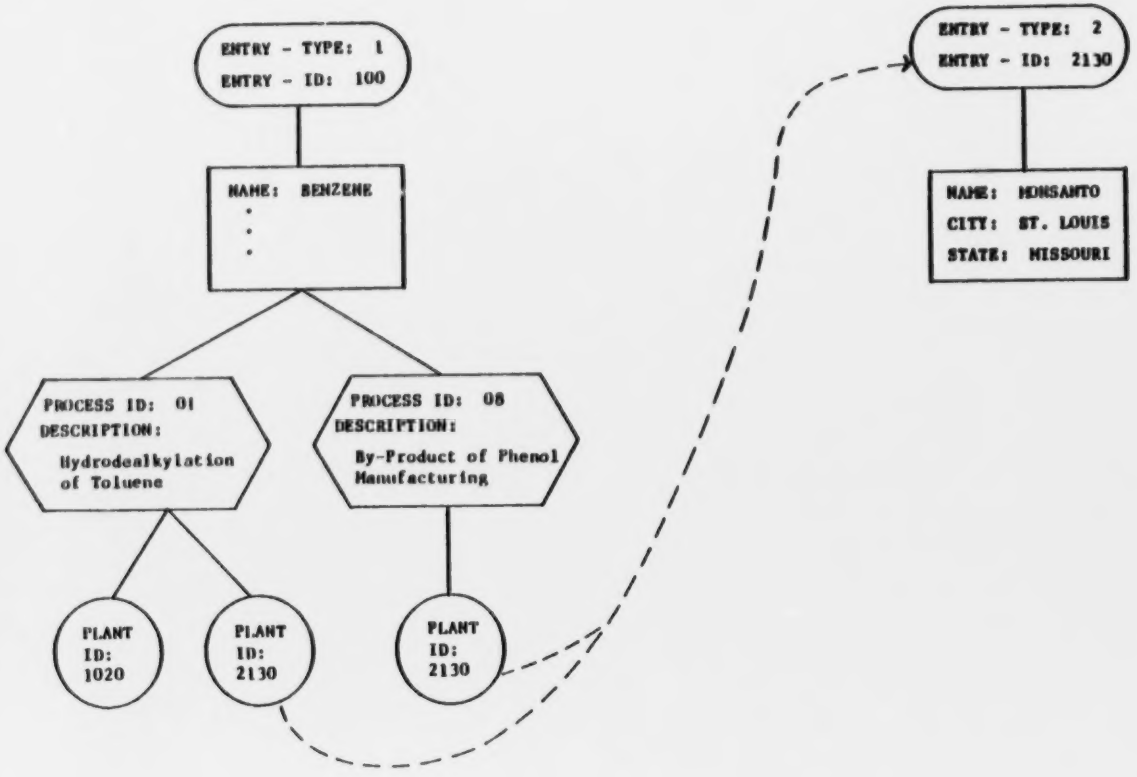


Figure 4. Product/producer link for the OCPDB.

Table 4. OCPDB KEY DATA ELEMENTS

Chemical Product Entries

- Name
- OCPDB Number
- CAS Number
- Wiswesser Line Notation
- New Chemical Indicator
- Priority Pollutant Indicator
- Toxicity Mode, Species, Units
- Production Year
- Synonyms
- End Use Description
- End Use IPPEU Number
- Emission Factors
- Emission Factor Rating
- Process OCPDB Number
- Process IPPEU Number
- Producer OCPDB Number
- Producer Capacity

Producer Entries

- OCPDB Number
- Parent Company Name
- Producing Company Name
- City
- State
- River Basin
- EPA Region

Using any of the key data elements for retrieval, any other data value associated with a logical entry can be extracted from the data base.

Retrievals may be specific to a single entry. For example, during this maintenance task, a common retrieval request was an OCPDB search by CAS number. In this search, lists of compounds, identified only by CAS number, were input to the data base. The search program identified OCPDB chemicals with CAS numbers matching those on the list and retrieved all OCPDB information about those chemicals.

More general retrievals are also possible by specifying more complex or less specific search criteria. A frequently-received request for this type of search was a retrieval by river basin. In one such request, EPA asked that Radian retrieve all plants and plant-related information for producers located in seven river basins in EPA Region VI. Since river basin is a key data element associated with the majority of OCPDB plants, the request was filled quickly and easily.

A basic set of data retrieval capabilities evolved during the maintenance task. The capabilities, defined in System 2000® as "strings" or user-defined commands, are shown in Table 5 and are part of the OCPDB definition shown in Appendix B. Additional retrieval capabilities may be easily added to the data base as required.

Not all information retrieval requirements can be satisfied completely with the direct access retrieval facilities of System 2000® described above, however. For extremely complex retrievals or for analytical processing, System 2000® provides a procedure language interface (PLI) for use with high-level programming languages such as FORTRAN or COBOL. The power and flexibility of a high-level programming language is, thus, added to the efficient data management and retrieval functions of System 2000®, as shown diagrammatically in Figure 5. Some examples of complex retrievals and analytical reports produced during the maintenance task are discussed in Section 6.

TABLE 5. OCPDB STRINGS DEFINED AS OF DECEMBER 1980

```
3014*  LIST STATE (STRING (*LIST PLANT* WH C2005 EQ *1*)))
3005*  LIST PLANT (STRING (LIST/TITLE R(5)PLANT*ID,L(25)*COMPANY,L(25)
       *CITY,R(5)*STATE/C2,C2001,C2003,C2005,OB C2))
3004*  PRODUCT SLATE (STRING (LIST/REPEAT SUPPRESS,TITLE R(4)ID,L(2),
       L(30)CHEMICAL,L(35)PROCESS,R(10)CAPACITY/C2,C1401,C1001,C1402,C
       1412,OB C2,C1401 WH C1410 HAS C1411 EQ *1*)))
4000*  ADD END USE (STRING (APPEND TREE C1200 EQ 1201**2**END* WHERE A
       LL   OF (C1 EQ 1*, C2 EQ *1**)))
4001*  ADD END USE AMOUNT (STRING (APPEND TREE C1200 EQ 1201**2**1202*
       * 3**END* WHERE ALL OF (C1 EQ 1*, C2 EQ *1**)))
4002*  ADD END USE PERCENT (STRING (APPEND TREE C1200 EQ 1201**2**1203
       **3**END* WHERE ALL OF (C1 EQ 1*, C2 EQ *1**)))
4003*  ADD END USE IPPEU (STRING (APPEND TREE C1200 EQ 1201**2**1204**
       3 **END* WHERE ALL OF (C1 EQ 1*, C2 EQ *1**)))
4004*  ADD END USE DATA (STRING (APPEND TREE C1200 EQ 1201**2**1202**3
       **1203**4**END* WHERE ALL OF (C1 EQ 1*, C2 EQ *1**)))
4005*  ADD PROCESS (STRING (APPEND TREE C1400 EQ 1401**2**1402**3**END
       *  WHERE ALL OF (C1 EQ 1*, C2 EQ *1**)))
4009*  MAKERS (STRING (PR/REPEAT SUPPRESS/C2,C1001,C1401,C1402,C1411 W
       H C2 EQ  *1*)))
4010*  PLANT (STRING (PR/REPEAT SUPPRESS/C2,C2001,C2003,C2005 WH C2 EQ
        *1*)))
4011*  DESCRIBE CHEMICAL (STRING (PRINT/NAME/C0 WH C2 EQ *1* AND C1 EQ
        1)))
4020*  ADD END DATA (STRING (APPEND TREE C1200 EQ 1201**2**1202**3**12
       03**4**1204**5**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**))))

4021*  ADD DOM IPPEU (STRING (APPEND TREE C1200 EQ 1201**2**1203**3**1
       204 **4**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**)))
4022*  ADD END USE DOM (STRING (APPEND TREE C1200 EQ 1201 **2**1203**3
       **END* WHERE ALL OF (C1 EQ 1*,C2 EQ*1**)))
4023*  ADD PROD DATA (STRING (APPEND TREE C1100 EQ 1101**2**1102**3**
       1103**4**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**)))
4016*  ADD PRODUCTION (STRING (APPEND TREE C1100 EQ 1101**2**1102**3**
       1103**4**1104**5**END* WHERE ALL OF(C1 EQ 1*,C2 EQ *1**)))
4030*  REMOVE END USE TREE (STRING (REMOVE TREE C1200 WHERE ALL OF (C1
        EQ 1*, C2 EQ *1**)))
4031*  REMOVE WLN (STRING (REMOVE C1006 WHERE ALL OF (C1 EQ 1*, C2 EQ
       *1**)))
4032*  ADD SYNONYM (STRING (APPEND TREE C1300 EQ 1301**2**END*WHERE AL
       L OF (C1 EQ 1*,C2 EQ *1**)))
4038*  CHANGE END USE DESC (STRING (CHANGE C1200 EQ 1201**2**END* WHER
       E ALL OF (C2 EQ *1**,C1201 EQ *3**)))
4037*  ADD PRODUCER DATA (STRING (APPEND TREE C1410 EQ 1411**2**1412**
       3**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**,C1401 EQ *4**)))
4043*  CHANGE WLN (STRING (ASSIGN C1006 EQ *2** WHERE ALL OF   (C1 EQ
       1*,C2 EQ *1**)))
4046*  CHANGE PROD DATA INFO (STRING (ASSIGN C1100 EQ 1101**2**1102**3
       **1103**4**1104**5**END*  WHERE ALL OF (C2 EQ *1**, C1101 EQ *6
       **)))
4033*  ADD AMT TO PROD DATA (STRING (ADD C1102 EQ *3** WHERE ALL OF (C
       2 EQ *1**,C1101 EQ *2**)))
4034*  ADD CAPACITY TO PRODUCER (STRING (ADD C1412 EQ *3** WHERE ALL O
       F (C2 EQ *1**,C1411 EQ *2**,C1401 EQ *4**)))
4035*  ADD END USG* AMT TO END DATA (STRING (ADD C1202 EQ *3** WHERE A
       LL OF (C2 EQ *1**,C1201 EQ *2**)))
3012*  PUT VOLUME IN (STRING (ADD C1102 EQ *3** WHERE ALL OF  (C2 EQ *
       1**,C1101 EQ *2**)))
```

(Continued)

TABLE 5. (Continued)

```
3011* ADD SALES TO*PROD DATA (STRING (ADD C1104 EQ *3** WHERE ALL OF
      (C2 EQ *1**,C1101 EQ *2**)))
3030* CHANGE VOL OF PROD DATA (STRING (ASSIGN C1102 EQ *3**  WHERE AL
      L OF (C2 EQ *1**, C1101 EQ *2**))))
4007* ADD PROD YR & UNIT COST (STRING (APPEND TREE C1100 EQ 1101**2**
      1103**3**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**))))
4006* ADD PROD YEAR & VOLUME (STRING (APPEND TREE C1100 EQ 1101**2**1
      102 **3**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**))))
4008* ADD YEAR & SALES (STRING (APPEND TREE C1100 EQ 1101**2**1104**3
      **END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**))))
3224* ADD UNIT COST TO PROD (STRING (ADD C1103 EQ*3**  WHERE ALL OF (
      C2 EQ  *1**,C1101 EQ *2**))))
3226* ADD YEAR VOLUME & SALES (STRING (APPEND TREE C1100 EQ 1101**2**
      1102**3**1104**4**END*   WHERE ALL OF (C1 EQ 1*,C2 EQ *1**))))
3227* ADD IPPEU TO END USE (STRING (ADD C1204 EQ *3**   WHERE ALL OF
      (C2 EQ *1**,C1201 EQ *2**))))
3228* REMOVE ONE END USE (STRING (REMOVE TREE C1200   WHERE ALL OF (C
      2 EQ *1**,C1201 EQ *2**))))
4036* ADD PERCENT*DOM TO END DATA (STRING (ADD C1203 EQ *3**  WHERE A
      LL OF (C2 EQ *1**,C1201 EQ *2**))))
4045* CHANGE PROD DATA EXCEPT YEAR (STRING (CHANGE C1100 EQ 1101**2**
      1102**3**1103**4**1104**5**END*  WHERE ALL OF (C2 EQ *1**,C1101
       EQ *2**))))
3200* CHANGE PLANT NAME (STRING (ASSIGN C2001 EQ *2**  WHERE ALL OF (
      C1 EQ 2*, C2 EQ *1**))))
3202* CHANGE STATE (STRING (ASSIGN C2004 EQ *2**   WHERE ALL OF (C1 E
      Q 2*, C2 EQ *1**))))
3203* CHANGE STATE CODE (STRING (ASSIGN C2005 EQ *2**  WHERE ALL OF (
      C1 EQ 2*, C2 EQ *1**))))

3223* CHANGE PROCESS (STRING (CHANGE C1400 EQ 1401**3**1402**4**END*
       WHERE ALL OF (C2 EQ *1**,C1401 EQ *2**))))
3225* ADD YEAR UNIT & SALES (STRING (APPEND TREE C1100 EQ 1101**2**11
      03**3**1104**4**END*   WHERE ALL OF (C1 EQ 1*,C2 EQ *1**))))
3201* CHANGE CITY (STRING (ASSIGN C2003 EQ *2**  WHERE ALL OF (C1 EQ
      2*, C2 EQ *1**))))
3221* ADD PARENT COMPANY (STRING (APPEND TREE C2100 EQ 2101**2**END*
       WHERE ALL OF (C1 EQ 2*,C2 EQ *1**))))
4026* ADD PRODUCT (STRING (APPEND TREE C1410 EQ 1411**3**END* WHERE A
      LL OF (C1 EQ 1*,C2 EQ *1**,C1401 EQ *2**))))
3229* ADD PRODUCT DATA (STRING (APPEND TREE C1410 EQ 1411**2** 1412**
      3**END* WHERE ALL OF(C1 EQ 1*,C2 EQ *1**,C1401 EQ *4**))))
3040* CHANGE CAPACITY (STRING (ASSIGN C1410 EQ 1411**2**1412**3**END*
       WHERE ALL OF (C2 EQ *1**,C1411 EQ *2**,C1401 EQ *4**))))
3211* DELETE PRODUCT (STRING (REMOVE TREE C1410   WHERE ALL OF (C2 EQ
       *1**,C1401 EQ *2**,C1411 EQ *3**))))
3220* CHANGE PARENT COMPANY (STRING (CHANGE C2101 EQ *3**   WHERE ALL
       OF (C1 EQ 2*,C2 EQ *1**,C2101 EQ *2**))))
3222* REMOVE PARENT COMPANY (STRING (REMOVE TREE C2100  WHERE ALL OF
      (C2 EQ *1**,C2101 EQ *2**))))
2500* CHANGE PROCESS DESC (STRING (ASSIGN C1402 EQ *3**  WHERE ALL OF
       (C2 EQ *1**,C1401 EQ *2**))))
2501* CHANGE CAS (STRING (ASSIGN C1002 EQ *2** WHERE ALL  OF (C1 EQ 1
      *,C2 EQ *1**))))
2502* CHANGE CONFIDENTIAL FLAG (STRING (ASSIGN C1004 EQ *2**  WHERE A
      LL OF (C1 EQ 1*,C2 EQ *1**))))
2503* CHANGE POLLUTANT FLAG (STRING (ASSIGN C1005 EQ *2**  WHERE ALL
      OF (C1 EQ 1*,C2 EQ *1**))))
2504* CHANGE NIOSH (STRING (ASSIGN C1007 EQ *2** WHERE ALL  OF (C1 EQ
       1*,C2 EQ *1**))))
```

(Continued)

TABLE 5. (Continued)

```
2505* CHANGE CHEM-NAME (STRING (ASSIGN C1001 EQ *2** WHERE ALL OF (C1
      EQ 1*,C2 EQ *1**)))
2506* CHANGE RIVER BASIN (STRING (ASSIGN C2007 EQ *2**  WHERE ALL OF
      (C1 EQ 2*,C2 EQ *1**); ASSIGN C2008 EQ *3** WHERE ALL  OF (C1
      EQ 2*, C2 EQ *1**)))
2514* ASSIGN TLV (STRING (ASSIGN C1018 EQ *2** WHERE ALL OF   (C1 EQ
      1*,C2 EQ *1**)))
2515* ASSIGN TLV UNITS (STRING (ASSIGN C1019 EQ *2** WHERE  ALL OF (C
      1 EQ 1*,C2 EQ *1**)))
2516* ASSIGN AQTX-TLM96-FROM (STRING (ASSIGN C1016 EQ *2**  WHERE ALL
      OF (C1 EQ 1*,C2 EQ *1**)))
2517* ASSIGN AQTX-TLM96-TO (STRING (ASSIGN C1017 EQ *2**  WHERE ALL O
      F (C1 EQ 1*,C2 EQ *1**)))
2615* REMOVE PROD DATA TREE (STRING (REMOVE TREE C1100 WHERE ALL OF (
      C2 EQ *1**, C1101 EQ *2**)))
2616* REMOVE SYNONYM (STRING (REMOVE TREE C1300  WHERE ALL OF (C2 EQ
      *1**, C1301 EQ *2**)))
2617* REMOVE PROCESS IPPEU (STRING (REMOVE TREE C1420  WHERE ALL OF
      (C2 EQ *1**, C1401 EQ *2**)))
2618* REMOVE EMISSION TREE (STRING (REMOVE TREE C1440  WHERE ALL OF (
      C2 EQ *1**, C1441 EQ *2**, C1401 EQ *3**)))
2619* REMOVE EMISSION RATING (STRING (REMOVE C1442  WHERE ALL OF (C2
      EQ *1**, C1441 EQ *2**, C1401 EQ *3**)))
2620* REMOVE EMISSION AMOUNT (STRING (REMOVE C1443  WHERE ALL OF (C2
      EQ *1**, C1441 EQ *2**, C1401 EQ *3**)))
2621* REMOVE PROCESS (STRING (REMOVE TREE C1400  WHERE ALL OF (C2 EQ
      *1**, C1401 EQ *2**)))
2507* ASSIGN LD50 (STRING (ASSIGN C1008 EQ*2** WHERE ALL OF  (C1 EQ 1
      *,C2 EQ*1**);ASSIGN C1009 EQ*3** WHERE ALL OF (C1 EQ 1*,C2 EQ*1
      **); ASSIGN C1010 EQ*4** WHERE ALL OF(C1 EQ 1*,C2 EQ*1**);ASSIG

      N C1011 EQ*5**  WHERE ALL OF (C1 EQ 1*,C2 EQ*1**)))
2509* ASSIGN LCL0 (STRING (ASSIGN C1012 EQ*2** WHERE ALL OF (C1 EQ 1*
      ,C2 EQ*1**);ASSIGN C1013 EQ*3** WHERE ALL OF(C1 EQ 1*,C2 EQ*1**
      );ASSIGN C1014 EQ*4**WHERE ALL OF(C1 EQ 1*,C2 EQ*1**);ASSIGN C1
      015 EQ*5** WHERE ALL OF(C1 EQ 1*,C2 EQ*1**)))
2600* REMOVE CAPACITY (STRING (REMOVE C1412 WHERE ALL OF(C2 EQ*1**,C1
      401 EQ *2**,C1411 EQ*3**)))
2510* ASSIGN LOCAL ACUTE (STRING (ASSIGN C1020 EQ*2** WH C1 EQ 1 AND
      C2 EQ*1*;ASSIGN C1021 EQ*3** WH SAME;ASSIGN C1022 EQ*4** WH SAM
      E;ASSIGN  C1023 EQ*5** WH SAME;ASSIGN C1024 EQ*6** WH SAME;))
3300* CHANGE UNIT COST & YEAR (STRING (ASSIGN C1103 EQ *3** WH C1 EQ
      1 AND C2 EQ*1* AND C1101 EQ*2*; ASSIGN C1101 EQ*4** WH SAME;)))
2508* CHANGE PLANT PROCESS (STRING (REMOVE TREE C1410 WHERE ALL OF(C2
      EQ*1**,C1411 EQ*2**,C1401 EQ*4**,C1 EQ 1*);ASSIGN C1410 EQ  14
      11**2**1412**3**END* WHERE ALL OF(C1 EQ 1*,C1401 EQ*5**,C2 EQ*1
      **);))
3212* DELETE PRODUCER (STRING (REMOVE TREE ENTRY WHERE ALL OF  (C1 EQ
      2*,C2 EQ*1**);))
2601* REMOVE CHEMICAL (STRING (REMOVE TREE ENTRY WHERE ALL OF  (C1 EQ
      1*,C2 EQ*1**);))
2602* REMOVE CAS (STRING (REMOVE C1002 WH C2 EQ *1*;))
2603* REMOVE NEWFLAG (STRING (REMOVE C1003 WH C2 EQ*1* AND C1 EQ 1;))

2604* REMOVE CONFIDENTIAL FLAG (STRING (REMOVE C1004 WH C1 EQ 1 AND C
      2 EQ*1*;))
2605* REMOVE PRIORITY POLLUTANT (STRING (REMOVE C1005 WH C1 EQ 1 AND
      C2 EQ*1*;))
2606* REMOVE NIOSH (STRING (REMOVE C1007 WH C1 EQ 1 AND C2 EQ*1*;))
2607* REMOVE AQTX-TLM96-FROM (STRING (REMOVE C1016 WH C1 EQ 1 AND C2
      EQ*1*;))
```

(Continued)

TABLE 5. (Continued)

```
2608* R*MOVE AQTI*TLM96*TO (STRING (REMOVE C1017 WH C1 EQ 1 AND C2 EQ
      *1*)))
2511* ASSIGN LOCAL CHRONIC (STRING (ASSIGN C1025 EQ*2** WH C1 EQ 1 AN
      D  C2 EQ*1*)ASSIGN C1026 EQ*3** WH SAME)ASSIGN C1027 EQ*4** WH
      SAME)  ASSIGN C1028 EQ*5** WH SAME)ASSIGN C1029 EQ*6** WH SAME)
      ))
2609* REMOVE LD50 DATA (STRING (REMOVE C1008 WH C2 EQ*1* AND C1 EQ 1)
       REMOVE C1009 WH SAME)REMOVE C1010 WH SAME)REMOVE C1011 WH SAME
      )))
2610* REMOVE LCL0 DATA (STRING (REMOVE C1012 WH C1 EQ 1 AND C2 EQ*1*)
       REMOVE C1013 WH SAME)REMOVE C1014 WH SAME)REMOVE C1015 WH SAME
      )))
2611* REMOVE LOCAL ACUTE DATA (STRING (REMOVE C1020 WH C1 EQ 1 AND C2
       EQ*1*)REMOVE C1021 WH SAME)REMOVE C1022 WH SAME)REMOVE C1023 W
      H SAME) REMOVE C1024 WH SAME)))
2612* REMOVE LOCAL CHRONIC DATA (STRING (REMOVE C1025 WH C1 EQ 1 AND
      C2 EQ*1*) REMOVE C1026 WH SAME)REMOVE C1027 WH SAME)REMOVE C102
      8 WH SAME) REMOVE C1029 WH SAME)))
2613* REMOVE SYSTEMIC ACUTE DATA (STRING (REMOVE C1030 WH C1 EQ 1 AND
       C2 EQ*1*) REMOVE C1031 WH SAME)REMOVE C1032 WH SAME)REMOVE C10
      33 WH SAME)  REMOVE C1034 WH SAME)))
2614* REMOVE SYSTEMIC CHRONIC DATA (STRING (REMOVE C1035 WH C1 EQ 1 A
      ND C2 EQ*1*)  REMOVE C1036 WH SAME)REMOVE C1037 WH SAME)REMOVE
      C1038 WH SAME)  REMOVE C1039 WH SAME)))
2512* ASSIGN SYSTEMIC ACUTE (STRING (ASSIGN C1030 EQ*2** WH C1 EQ 1
      AND C2 EQ*1*)ASSIGN C1031 EQ*3** WH SAME)ASSIGN C1032 EQ*4** WH
         SAME)ASSIGN C1033 EQ*5** WH SAME)ASSIGN C1034 EQ*6** WH SAME
      )))
2513* ASSIGN SYSTEMIC CHRONIC (STRING (ASSIGN C1035 EQ*2** WH C1 EQ 1
        AND C2 EQ*1*)ASSIGN C1036 EQ*3** WH NAME)ASSIGN C1037 EQ*4**
       WH   SAME)ASSIGN C1038 EQ*5** WH SAME)ASSIGN C1039 EQ*6** WH SA
       ME)))
```

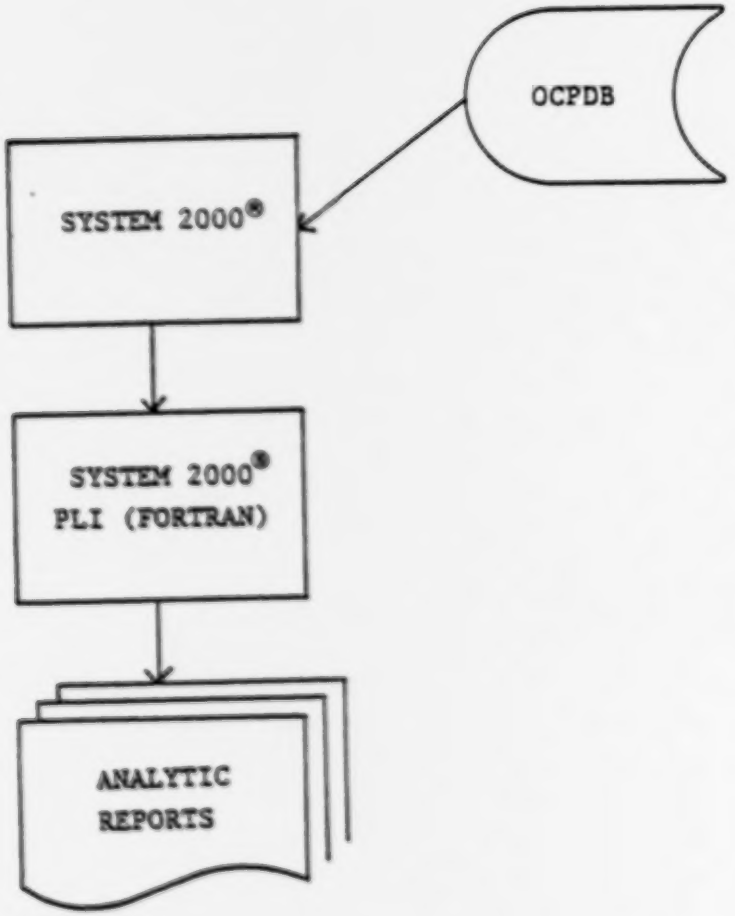


Figure 5. OCPDB PLI retrieval (for complex or special retrieval).

SECTION 5

QUALITY ASSURANCE

An extensive quality assurance (QA) program was developed for the OCPDB early in this maintenance task. The QA program was designed to assure accuracy in three areas: (1) the OCPDB as a whole; (2) new data input (updating or expanding); and (3) data output (report generation). Implementation of the program, which utilitized both automated and manual QA procedures, is described in the following paragraphs.

QA FOR THE OVERALL OCPDB

In the initial phase of the QA program, the OCPDB was closely scrutinized so that any incorrect data items resulting from past errors could be eliminated. A statistically reliable sampling plan was designed by Radian's Quality Assurance Director to achieve any specified level of accuracy. The sampling plan was implemented twice during this task, as a routine check for error propagation. An example sampling plan is shown in Table 6.

One QA check indicated that error propagation in the OCPDB was greater than that desired by EPA. As a result, the entire data base was reviewed, as specified in the QA program. During this review, the System 2000® TALLY command was used to verify the existence of key data elements in the OCPDB. This command, which lists and tabulates all unique data items within each file, was used to insure that no incorrect items remained in the OCPDB and that no data items were missing.

DATA INPUT

Several automated measures for data input QA are inherent in System 2000®. Because System 2000® allows numeric data elements to be defined with a maximum field size which input data cannot exceed, the maximum field size for OCPDB numeric entries was defined and used as a QA tool. This tool prevented input to the OCPDB of grossly unreasonable values which did not fall within the defined value range.

System 2000® strings, discussed previously, provided a powerful QA technique. Using strings to input data greatly reduced the risk of committing procedural errors, because a

TABLE 6. EXAMPLE OCPDB QA SAMPLING PLAN

Sample Size (# Records Examined)	Maximum % Error Rate[1] 90% Confidence Allow 0 Error/ Sample	90% Confidence Allow 1 Error/ Sample	95% Confidence Allow 0 Error/ Sample	95% Confidence Allow 1 Error/ Sample
500[2]	0.45	0.7[2]	0.6	1.0
800	0.35	0.5	0.4	0.6
1,000	0.3	0.4	0.38	0.5
1,300	0.2	0.3	0.35	0.4
2,000	0.15	0.25	0.3	0.35
3,000	0.07	0.20	0.1	0.25
6,000	0.04	0.07	0.05	0.1
10,000	0.02	0.04	0.03	0.05

[1] Assuming the size of the data base ranges between 15,000 and 20,000 records.

[2] If 500 OCPDB records are examined, and 1 error is found, then one could be 90% confident that 0.7% of the OCPDB records could contain errors.

relatively complex set of commands for a variety of data sets could be implemented using a single, simple string command. Data coding was simplified by the use of strings, thus minimizing errors in data transcription.

Quality assurance measures were taken during each step of an OCPDB update conducted as a part of this maintenance task. Pertinent, verified technical information was recorded on standardized forms similar to the one illustrated in Figure 6. Data from the coding sheets were punched on cards and verified. From these cards, a list of new entries (additions, deletions, and changes) was prepared using the TALLY command. Each item on the list was manually inspected for accuracy.

After the accuracy of input data had been verified, the data were loaded into System 2000®, thus creating an updated version of the OCPDB. Portions of standard report programs were generated and manually inspected to insure that the data had been accurately loaded.

Organic Chemical Producers Data Base

Update Form 4(a): Chemical Identifiers and Toxicity Data

coded by:_____ date:_____

|e|entry id*_____*1000*product*_____*

CAS number*_____*

new in DB flag*_____*

confidential product flag*_____*

Wiswesser line notation*_____*

priority pollutant flag*_____*

NIOSH number*_____*

LD50 mode*_____*LD50 species*_____*LD50 amount*_____ _____*LD50 units*_____*

LCLO mode*_____*LCLO species*_____*LCLO amount*_____ _____*LCLO units*_____*

AQTX-TLM96-FROM*_____*AQTX-TLM96-TO*_____*

TLV*_____* TLV units*_____*

L-A-ING*_____* L-A-INH*_____* L-A-IRR*_____* L-A-SKIN*_____* L-A-ALL*_____*

L-C-ING*_____* L-C-INH*_____* L-C-IRR*_____* L-C-SKIN*_____* L-C-ALL*_____*

S-A-ING*_____* S-A-INH*_____* S-A-IRR*_____* S-A-SKIN*_____* S-A-ALL*_____*

S-C-ING*_____* S-C-INH*_____* S-C-IRR*_____* S-C-SKIN*_____* S-C-ALL*_____*

Entry id = unique OCPDB identifier; CAS = Chemical Abstracts Service; code '1' for 'new in DB flag', 'P' for 'priority pollutant flag' if EPA priority pollutant; ignore 'confidential product flag'.
AQTX-TLM96 = aquatic toxicity; TLV = total lethal value.
Sx: toxicity ratings: L-A: local/acute; L-C: local/chronic; S-A: systemic/acute; S-C: systemic/chronic; ING = ingestion; INH = inhalation; IRR = irritant; ALL = allergen.

Figure 6. Sample OCPDB coding form.

DATA OUTPUT

As each OCPDB report was generated for the first time, report formats and software were validated. The maximum and minimum fields defined within System 2000® were used to check for truncation of data items. Each report was paginated so that printing errors or problems due to transmission difficulties could be easily located. The total page count, tallied at the end of each report, was used to indicate a report's accurate completion.

Each report was programmed so that the date of the most recent update was printed on every page. This QA measure enabled report users to easily determine the version of the OCPDB in their possession.

DBMS BACKUP MEASURES

Backup measures were taken to protect the integrity of the OCPDB while loaded into System 2000®. Boeing Computer Services provided an automatic backup system in which all OCPDB files were recorded on tape at least twice daily. These tapes insured that the OCPDB, if inadvertently lost or damaged, could be recovered with minimal loss of time or data. Weekly-generated backup tapes were retained by Boeing Computer Services for a year after generation, thus allowing recovery of "old" versions of the OCPDB.

Within System 2000® an additional backup device was available. An audit trail feature was used to record all OCPDB updates on tape. If a current version of the OCPDB had been damaged, the update information stored by the audit trail could have been applied to an older version, automatically restoring the data base to its latest form.

SECTION 6

SAMPLE OCPDB REPORTS

The capabilities of the OCPDB system are such that the types of reports which may be generated are virtually unlimited. However, a number of frequently-requested reports became "standard" during this task. Designed to relay a maximum amount of information in a format most useful to potential users, these reports formed the backbone of the OCPDB report system. Modifications were often made to the standard reports to even more closely respond to particular users' needs.

Five standard reports are described in this section. These reports illustrate several of the many ways in which OCPDB data may be accessed and reported. Also included in this section are examples of special analytical reports whose production involved high-level programming or OCPDB interface with other data base management systems.

NATIONWIDE PRODUCT DATA REPORT

Most-requested of the OCPDB standard reports was the Nationwide Product Data Report, an example of which is discussed previously in Section 3 and shown in Figure 1. This report, which retrieves information by chemical entry name, contains both chemical- and producer-related information.

Several OCPDB users obtained a Nationwide Product Data Report for those chemicals involved in EPA's study of the synthetic organic chemical manufacturing industry (SOCMI). The information contained in this report was used in developing regulatory alternatives for SOCMI. Chemicals studied under the SOCMI program are noted with a "★" in Appendix A.

CHEMICALS AND PRODUCTION SITES REPORT

An abbreviated version of the Nationwide Product Data Report, the Chemicals and Production Sites Report, was commonly requested. This report is produced in two formats. The nationwide version is ordered by OCPDB chemical identification number. In the statewide format, primary retrieval is by state, with chemicals produced with each state listed in order by identification number. Each of these report formats is discussed below.

Nationwide Chemicals and Production Sites Report

An example Nationwide Chemicals and Production Sites Report is shown in Figure 7. As the figure shows, this report displays process-specific information about each chemical in a format identical to that in a Nationwide Product Data Report. Essentially, this report begins with the chemical-producer/process link and contains only process-related information.

The report shown in Figure 7 is an example of one containing multiple processes. Information describing Process 51, production of acetaldehyde through Wacker oxidation of ethylene, is given first. Following are two additional process descriptions with related information: Process 52, oxidation of ethanol, and Process 53, by-product of acrolein production. Plants located in the U.S. and its possessions are listed under each process.

A Nationwide Chemicals and Production Sites Report was generated for the SOCMI chemicals. Recipients of this report used the information it contained in evaluating regulatory options for the synthetic organic chemical manufacturing industry.

Statewide Chemicals and Production Sites Report

Process-specific producer information is organized in a Statewide Chemicals and Production Sites Report to allow an OCPDB user to examine only chemicals produced in a particular state. An example of this report is shown in Figure 8, which is a portion of the Chemicals and Production Sites Report for the State of Delaware, in EPA Region 3.

As the example shows, OCPDB chemicals produced in Delaware are listed in order by chemical identification number. Process descriptions for each chemical follow, as does a list of plants within Delaware utilizing each process. As in the nationwide version of this report, available process-specific emission factor data and producer-related information (city, river basin, river basin code, and capacity, when available) are listed for each chemical.

STATEWIDE PLANTS AND PRODUCT SLATES REPORT

The OCPDB Statewide Plants and Product Slates Report contains information about OCPDB plants, their locations, the OCPDB chemicals they produce, the processes they employ, and their chemical-specific capacities. In this report, information retrieval is based on producer identification rather than chemical identification (a Type 2 entry rather than a Type 1 entry). An example of this report is shown for Delaware in Figure 9.

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PRODUCTION SITES--NATIONWIDE

30 ACETALDEHYDE

51 OXIDATION OF ETHYLENE (WACKER)
IPPEU 83

EMISSION FACTORS

DESCRIPTION	RATING	AMOUNT (LBS/TON)
ETHANE	B	4.400000
ETHYLENE	B	54.700000
ACETALDEHYDE	B	.002000
METHANE	B	.001000
METHYL CHLORIDE	B	17.300000

PRODUCING PLANTS

1960 CELANESE CORP. 300.000 MMLBS/YR
BAY CITY TEXAS

RIVER BASIN: 12090402 EAST MATAGORDA BAY

1980 CELANESE CORP. 600.000 MMLBS/YR
CLEAR LAKE TEXAS

RIVER BASIN: 12040204 WEST GALVESTON BAY

Figure 7. Example Nationwide Chemicals and Production Sites Report. (Continued)

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PRODUCTION SITES--NATIONWIDE

3550 EASTMAN CHEM. PRODUCTS, INC. 500,000 MMLBS/YR
LONGVIEW TEXAS

RIVER BASIN: 12010002 MIDDLE SABINE

52 OXIDATION OF ETHANOL
IPPEU 123

EMISSION FACTORS

DESCRIPTION	RATING	AMOUNT (LBS/TON)
CO	C	5.520000
ETHANOL	C	10.000000
ETHYL ACETATE	C	10.000000
METHANE	C	38.900000

PRODUCING PLANTS

8640 PUBLICKER INDUSTRIES INC.
PHILADELPHIA PENNSYLVANIA

RIVER BASIN: 2040203 SCHUYLKILL

53 BY-PRODUCT OF ACROLEIN
IPPEU 252

Figure 7 (Continued)

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PRODUCTION SITES--NATIONWIDE

PRODUCING PLANTS

9660 SHELL CHEM. CO. 5.000 MMLBS/YR
NORCO LOUISIANA

RIVER BASIN: 8090203 EASTERN LOUISIANA COASTAL

Figure 7 (Continued)

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PRODUCTION SITES--STATEWIDE

REGION 3 - DELAWARE

155 ACRYLIC RESINS

0 UNSPECIFIED PROCESS

PRODUCING PLANTS

6830 REICHHOLD CHEMS.
CHESWOLD

RIVER BASIN: 2040207 BROADKILL-SMYRNA

189 ALKYDS AND UNSATURATED POLYESTER RESINS

51 ESTERIFICATION OF POLYHYDRIC ALCOHOLS + POLYBASIC ACIDS

PRODUCING PLANTS

5840 ICI AMERICAS INC.
NEW CASTLE

RIVER BASIN: 2040205 BRANDYWINE - CHRISTINA

Figure 8. Example Statewide Chemicals and Product Sites Report. (Continued)

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PRODUCTION SITES--STATEWIDE

REGION 3 - DELAWARE

380 BENZENE

51 PETROLEUM DERIVED (INCLUDES PROCESSES 53-56)

PRODUCING PLANTS

4930 GETTY REFINING AND MARKETING CO. 58.000 MMLBS/YR
DELAWARE CITY

RIVER BASIN: 2040205 BRANDYWINE - CHRISTINA

720 BUTYLENES

51 REFINERY GAS

PRODUCING PLANTS

4930 GETTY REFINING AND MARKETING CO. 65.000 MMLBS/YR
DELAWARE CITY

RIVER BASIN: 2040205 BRANDYWINE - CHRISTINA

Figure 8 (Continued)

The kinds of information contained in this report are best illustrated by the example entry for plant number 4930, Getty Refining and Marketing Company. Figure 9 shows that this plant, located in Delaware City, Delaware, produces six OCPDB chemicals: 380 benzene, 720 butylenes, 2140 heptene, 2701 naphthalene, 2810 nonene, and 3090 propylene. A description of production processes is included for each chemical, as is the plant's capacity. Process IPPEU numbers are included when available.

PLANTS AND PRODUCT SLATES BY RIVER BASIN REPORT

This report differs from the Statewide Plants and Product Slates Report in that it is organized by USGS-designated river basin rather than by state. The key element used for retrieval in this report is each river basin's code.

An excerpt from this report is shown in Figure 10. In the figure, plants located in two river basins are listed with their product slates and related process and capacity information. The geographic location of each plant (city and state) is also listed.

SPECIAL ANALYTICAL REPORTS

OCPDB users occasionally required special reports using data base information. In these reports, high level FORTRAN programming was used to organize and manipulate data so that detailed specific analyses could be conducted.

Two of these special analytical reports are described in this section. One involved linking the OCPDB as defined in System 2000® with the SAS statistical package (13). In the second report, a unique capability of the OCPDB, the "minimum site search" was used to identify a minimum number of OCPDB plants producing a given group of OCPDB chemicals.

Statistical Analytical Report

The report was developed to allow statistical analysis of quantitative production capacity data contained in the OCPDB. Special programming was designated to interface OCPDB information, defined in System 2000®, with statistical functions offered by the SAS statistical package.

The report included the following information:

- Total number of production sites in the OCPDB;
- Total number of chemicals in the OCPDB;
- Total number of OCPDB chemicals for which quantitative data are available;

LATEST UPDATE: 80/05/21

ORGANIC CHEMICAL PRODUCERS DATA BASE

PLANTS AND PRODUCT SLATES

REGION 3 - DELAWARE

680	AMERICAN HOECHST CORP.	DELAWARE CITY	
3008	POLYETHYENE TEREPHTHALATE		CAPACITY
53	FIBERS		4.000MMLBS.
3210	DIAMOND SHAMROCK CORP.	DELAWARE CITY	
3047	POLYVINYL CHLORIDE		CAPACITY
0	UNSPECIFIED		132.000MMLBS.
3790	E. I. DU PONT DE NEMOURS & CO., INC.	NEWARK	
3012	POLYIMIDES		
0	UNSPECIFIED PROCESS		
3800	E. I. DU PONT DE NEMOURS & CO., INC.	SEAFORD	
2822	NYLON 66		
53	FIBER		
4930	GETTY REFINING AND MARKETING CO.	DELAWARE CITY	
380	BENZENE		CAPACITY
51	PETROLEUM DERIVED (INCLUDES PROCESSES 53-56)		58.000MMLBS.
720	BUTYLENES		CAPACITY
51	REFINERY GAS		65.000MMLBS.
2140	HEPTENE		CAPACITY
51	POLYMERIZATION OF C3-C9 REFINERY GASES		85.000MMLBS.
2701	NAPHTHALENE		CAPACITY
52	PETROLEUM DERIVED		100.000MMLBS.
	IPPEU 209		

Figure 9. Example Statewide Plants and Product Slates Report. (Continued)

ORGANIC CHEMICAL PRODUCERS DATA BASE

PLANTS AND PRODUCT SLATES

REGION 5 - DELAWARE

2810	NONENE		CAPACITY
	51 POLYMERIZATION OF PROPYLENE		70.000MMLBS.
	IPPEU 265		
3090	PROPYLENE		CAPACITY
	52 FROM REFINING OPERATIONS		120.000MMLBS.
5645	HAVEG INDUST., INC.	WILMINGTON	
2905	PHENOLIC RESINS		
	51 POLYMERIZATION OF PHENOL & FORMALDEHYDE		
5840	ICI AMERICAS INC.	NEW CASTLE	
189	ALKYDS AND UNSATURATED POLYESTER RESINS		
	51 ESTERIFICATION OF POLYHYDRIC ALCOHOLS + POLYBASIC ACIDS		
2100	GLYCEROL TRI(POLYOXYPROPYLENE)ETHER		
	0 UNSPECIFIED PROCESS		
2414	LINEAR ALKYLATE SULFONATE		
	51 SULFONATION OF LINEAR ALKYLBENZENE		
6830	REICHHOLD CHEMS.	CHESWOLD	
155	ACRYLIC RESINS		
	0 UNSPECIFIED PROCESS		
3040	POLYVINYL ACETATE AND COPOLYMERS		
	0 UNSPECIFIED PROCESS		
9570	SETON CO.	WILMINGTON	
1656	EPOXY RESINS		
	0 UNSPECIFIED PROCESS		
3036	POLYURETHANE RESINS		
	52 RESINS		

Figure 9 (Continued)

ORGANIC CHEMICAL PRODUCERS DATA BASE

PLANTS AND PRODUCT SLATES

REGION 3 - DELAWARE

9920	STANDARD CHLORINE CHEMICAL CO., INC.	DELAWARE CITY	
	890 CHLOROBENZENE		CAPACITY
	51 CHLORINATION OF BENZENE		150.000MMLBS.
	IPPEU 4		
	1216 O-DICHLOROBENZENE		CAPACITY
	51 CHLORINATION OF BENZENE		50.000MMLBS.
	1220 P-DICHLOROBENZENE		CAPACITY
	51 CHLORINATION OF BENZENE		75.000MMLBS.
	3269 1,2,4,5-TETRACHLOROBENZENE		
	0 UNKNOWN		
	3393 1,2,4-TRICHLOROBENZENE		
	0 UNSPECIFIED PROCESS		
10050	AMOCO CHEMS. CORP.	NEW CASTLE	
	3020 POLYPROPYLENE AND COPOLYMERS RESIN/FIBER		CAPACITY
	0 UNSPECIFIED PROCESS		250.000MMLBS.
10160	STAUFFER CHEMICAL CO.	DELAWARE CITY	
	790 CARBON DISULFIDE		CAPACITY
	51 VAPOR PHASE SULFUR + METHANE		350.000MMLBS.
	IPPEU 165		
	3047 POLYVINYL CHLORIDE		CAPACITY
	0 UNSPECIFIED		280.000MMLBS.

Figure 9 (Continued)

ORGANIC CHEMICAL PRODUCERS DATA BASE

PLANTS AND PRODUCT SLATES

REGION 3 - DELAWARE

3049 PVC COPOLYMERS
0 UNSPECIFIED

10440 SUNOLIN CHEM. CO. CLAYMONT
1770 ETHYLENE CAPACITY
55 PYROLYSIS OF ETHANE/PROPANE & REFINERY GAS 225.000MMLBS.
1980 ETHYLENE OXIDE CAPACITY
0 UNSPECIFIED PROCESS 100.000MMLBS.

11675 WITCO CHEM. CORP. NEW CASTLE
3036 POLYURETHANE RESINS
51 FOAM
54 ELASTOMERS

Figure 9 (Continued)

ORGANIC CHEMICAL PRODUCERS DATA BASE

PLANTS AND PRODUCT SLATES
BY RIVER BASIN

1080801 MIDDLE CONNECTICUT

3030 MOBIL OIL CORP.
HOLYOKE MASSACHUSETTS

3039 POLYSTYRENE AND COPOLYMERS CAPACITY
0 UNSPECIFIED PROCESS 60.000MMLBS.

4695 MOBIL OIL CORP.
HOLYOKE MASSACHUSETTS

3039 POLYSTYRENE AND COPOLYMERS CAPACITY
0 UNSPECIFIED PROCESS 60.000MMLBS.

1080204 LOWER CONNECTICUT

3170 DEXTER CORP., THE
ROCKY HILL CONNECTICUT

155 ACRYLIC RESINS
0 UNSPECIFIED PROCESS
167 ALKYDS AND UNSATURATED POLYESTER RESINS
91 ESTERIFICATION OF POLYHYDRIC ALCOHOLS + POLYBASIC ACIDS
1656 EPOXY RESINS
0 UNSPECIFIED PROCESS
3036 POLYURETHANE RESINS
93 SURFACE COATING RESINS
3175 SILICONES
94 RESINS-HYDROLYSIS OF ORGANOCHLOROSILANES

Figure 10. Excerpt from Plants and Product Slates by River Basin Report. (Continued)

ORGANIC CHEMICAL PRODUCERS DATA BASE

PLANTS AND PRODUCT SLATES
BY RIVER BASIN

7120 MONSANTO CO.
SPRINGFIELD — MASSACHUSETTS

5	ABS	CAPACITY
	0 UNSPECIFIED	30.000MMLBS.
1670	ETHYL ACETATE	CAPACITY
	51 ESTERIFICATION	30.000MMLBS.
	IPPEU 102	
2040	FORMALDEHYDE	CAPACITY
	51 OXIDATION OF METHANOL	295.000MMLBS.
	IPPEU 203	
2443	MELAMINE-FORMALDEHYDE RESINS	
	51 CONTROLLED POLYMERIZATION OF MELAMINE & FORMALDEHYDE	
2510	METHYL ACETATE	
	0 UNSPECIFIED PROCESS	
2905	PHENOLIC RESINS	
	51 POLYMERIZATION OF PHENOL & FORMALDEHYDE	
3012	POLYIMIDES	
	0 UNSPECIFIED PROCESS	
3030	POLYSTYRENE AND COPOLYMERS	CAPACITY
	0 UNSPECIFIED PROCESS	300.000MMLBS.
3040	POLYVINYL ACETATE AND COPOLYMERS	
	0 UNSPECIFIED PROCESS	
3042	POLYVINYL ALCOHOL	CAPACITY
	51 HYDROLYSIS OF POLYVINYL ACETATE	45.000MMLBS.
3044	POLYVINYL BUTYRAL	
	51 CONDENSATION OF BUTYRALDEHYDE WITH POLYVINYL ACETATE	
3501	UREA FORMALDEHYDE RESIN	
	51 CONDENSATION OF UREA + FORMALDEHYDE	
	IPPEU 175 94	

Figure 10 (Continued)

- Total number of plants producing chemicals for which quantitative data are available;
- Mean overall capacity data;
- Standard deviation;
- Variance; and
- Standard error of mean.

Also included in the report were a series of graphical frequency distributions based on plant capacity. Supplementary economic data (cost per unit produced) was also provided for chemicals in each plant's product slate.

Minimum Site Search

A powerful OCPDB capability is its minimum site search. This tool was used to prepare a report for a user needing to identify the smallest group of plants which produced a specific group of OCPDB chemicals. Since it was unlikely that the entire group would be produced at one plant, a minimum site search was initiated to select at least one combination of plants meeting the minimum search requirements.

The procedure used to locate a minimum site list was an iterative process of elimination. First, a list of plants was generated which produce all the specified chemicals. A single plant producing most of the chemicals on the search list was then located and added automatically to the final list of plants chosen. If two or more plants produced the same maximum number of chemicals, a site was chosen on the basis of alphabetical order of the producer's name. The chemicals which were on both the search list and the product slate of the selected site were then removed from the search list, since they had been located. The process was repeated with the reduced search list. A plant producing the greatest number of the chemicals on this list was selected, and its OCPDB product slate removed from the search list. Ultimately, when the search list was emptied, all of the originally specified chemicals were covered by a minimal set of sites.

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APPENDIX A

OCPDB CHEMICALS AND PROCESSES★

★Indicates SOCMI Chemicals

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
5	9003569	ABS 0 UNSPECIFIED
12	83329	ACENAPHTHENE 51 FROM COAL TAR
15	208968	ACENAPHTHYLENE 51 UNKNOWN
*20	105577	ACETAL 0 UNSPECIFIED PROCESS 51 CONDENSATION OF ACETALDEHYDE AND ETHANOL
*30	75070	ACETALDEHYDE 51 OXIDATION OF ETHYLENE (WACKER) 52 OXIDATION OF ETHANOL 53 BY-PRODUCT OF ACROLEIN
*40	107891	ACETALDOL 0 UNSPECIFIED PROCESS 51 CONDENSATION OF ACETALDEHYDE
*50	60355	ACETAMIDE 0 UNSPECIFIED PROCESS 51 AMMONOLYSIS OF ETHYL ACETATE
*65	103844	ACETANILIDE 0 UNSPECIFIED PROCESS 51 ANILINE, ACETIC ACID, ACETYL CHLORIDE 52 ANILINE + ACETIC ACID
*70	64197	ACETIC ACID 51 N-BUTANE LIQUID PHASE OXIDATION 52 OXIDATION OF ACETALDEHYDE (WACKER) 53 CARBONYLATION OF METHANOL 54 GLYCERIN BY-PRODUCT 55 ETHYL ALCOHOL-OXIDATION

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		56 PERACETIC ACID
75		ACETIC ACID SALTS
		0 UNSPECIFIED PROCESS
		51 NEUTRALIZATION
*80	108247	ACETIC ANHYDRIDE
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF ACETALDEHYDE (WACKER)
		52 KETENE AND ACETIC ACID
*90	67641	ACETONE
		51 OXIDATION OF CUMENE
		52 DEHYDROGENATION OF ISOPROPANOL
		53 PROPYLENE OXIDE BY-PRODUCT; CRUDE
		54 2-NAPHTHOL BY-PRODUCT
		55 HYDROQUINONE BY-PRODUCT
		56 OXIDATION OF ISOPROPANOL
		57 BYPRODUCT OF BUTENE DEHYDROGENATION
*100	75865	ACETONE CYANOHYDRIN
		0 UNSPECIFIED PROCESS
		51 CONDENSATION OF ACETONE AND HYDROGEN CYANIDE
*110	75058	ACETONITRILE
		0 UNSPECIFIED
		51 BYPRODUCT OF ACRYLONITRILE
*120	98862	ACETOPHENONE
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF ETHYLBENZENE
		52 BY-PRODUCT OF PHENOL/ACETONE FROM CUMENE
*125	75365	ACETYL CHLORIDE
		0 UNSPECIFIED PROCESS
		51 GLACIAL ACETIC ACID + PHOSPHOROUS TRICHLORIDE
*130	74862	ACETYLENE
		51 BASF, PARTIAL OXIDATION OF METHANE

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		52 FROM CALCIUM CARBIDE
		53 BY-PRODUCT OF ETHYLENE
		54 WULFF PROCESS,FROM ETHANE
		55 SOCIETE BELEGE DE L'AZOTO
*140	107028	ACROLEIN
		51 OXIDATION OF PROPYLENE
*150	79061	ACRYLAMIDE
		51 HYDRATION OF ACRYLONITRILE
155	9003014	ACRYLIC RESINS
		0 UNSPECIFIED PROCESS
		51 SUSPENSION POLYMERIZATION
		52 SOLUTION POLYMERIZATION
156		ACRYLIC FIBER
		51 SOLUTION POLYMERIZATION
		52 SUSPENSION POLYMERIZATION
		53 WET SPINNING
		54 DRY SPINNING
*162	79107	ACRYLIC ACID
		51 MODIFIED REPPE
		52 PROPYLENE OXIDATION
164		ACRYLATE ESTERS
		0 UNSPECIFIED
		51 MODIFIED REPPE
		52 PROPYLENE OXIDATION
*170	107131	ACRYLONITRILE
		51 AMMOXIDATION OF PROPYLENE
*180	124049	ADIPIC ACID
		51 OXIDATION OF PHENOL
		52 OXIDATION OF CYCLOHEXANE

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*185	111693	ADIPONITRILE
		0 UNSPECIFIED PROCESS
		51 FROM BUTADIENE AND HCN
		52 ELECTROLYTIC PRODUCTION FROM ACRYLONITRILE
186		MIXED ALCOHOL PHTHALATES
		51 ESTERFICATION
187	309002	ALDRIN
		0 UNSPECIFIED PROCESS
		51 ACETYLENE,CYCLOPENTADIENE,HEXACHLORUCYCLOPENTADIENE
189		ALKYDS AND UNSATURATED POLYESTER RESINS
		51 ESTERIFICATION OF POLYHYDRIC ALCOHOLS + POLYBASIC ACIDS
*190		ALKYLNAPHTHALENES(METHYL)
		51 COAL TAR DERIVATIVE
*200	107186	ALLYL ALCOHOL
		0 UNSPECIFIED PROCESS
		51 FROM ACROLEIN AND SEC-BUTYL ALCOHOL
		52 ISOMERIZATION OF PROPYLENE OXIDE
*210	107051	ALLYL CHLORIDE
		51 CHLORINATION OF PROPYLENE
*220		AMINOBENZOIC ACID (M,P)
		0 UNSPECIFIED PROCESS
		51 CATALYTIC REDUCTION OF NITROBENZOIC ACIDS (M,P)
*230	111411	AMINOETHYLETHANOLAMINE
		0 UNSPECIFIED PROCESS
		51 ETHYLENE DIAMINE WITH ETHYLENE CHLOROHYDRIN
		52 ETHYLENE DIAMINE WITH ETHYLENE OXIDE
*235	123308	P-AMINOPHENOL
		0 UNSPECIFIED PROCESS

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		51 REDUCTION OF P-NITROPHENOL WITH FE+HCL
		52 ELECTROLYTIC REDUCTION OF NITROBENZENE
*240		AMYL ACETATES
		51 ESTERIFICATION OF AMYL ALCOHOLS WITH ACETIC ACID
*250		AMYL ALCOHOLS (8 ISOMERS)
		0 UNSPECIFIED PROCESS
		51 OXO PROCESS
		52 HYDROLYSIS OF AMYL CHLORIDES
*260	110587	AMYLAMINE
		0 UNSPECIFIED PROCESS
		51 AMYL CHLORIDE + AMMONIA
*270	543599	AMYL CHLORIDE
		51 CHLORINATION OF PENTANE/ISOPENTANE
*280		AMYL MERCAPTANS
		0 UNSPECIFIED PROCESS
		51 AMYL CHLORIDE + HYDROSULFIDE
*290	1322061	AMYL PHENOL
		0 UNSPECIFIED PROCESS
		51 UNKNOWN
*300	62533	ANILINE
		51 HYROGENATION OF VAPORIZED NITROBENZENE
		52 ICI PROCESS
*310	142041	ANILINE HYDROCHLORIDE
		51 NEUTRALIZATION
*320	29191524	ANISIDINE
		0 UNSPECIFIED PROCESS
		51 REDUCTION OF NITROANISOLE
*330	100663	ANISOLE
		0 UNSPECIFIED PROCESS

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		51 METHYLATION OF PHENATE SALT (METHYL CHLORIDE)
		52 METHYLATION OF PHENATE SALT (DIMETHYL SULFATE)
335	120127	ANTHRACENE
		51 COAL TAR FRACTION
*340	118923	ANTHRANILIC ACID
		0 UNSPECIFIED PROCESS
		51 FROM PHTHALIMIDE AND HYPOBROMITE OR HYPOCHLORITE
*350	84651	ANTHRAQUINONE
		0 UNSPECIFIED PROCESS
		51 CONDENSATION OF PHTHALIC ANHYDRIDE AND BENZENE-SOLVENT
		52 CONDENSATION OF PHTHALIC ANHYDRIDE + BENZENE-BALL MILL
358	50782	ASPIRIN
		51 ACETIC ANHYDRIDE AND SALICYLIC ACID
*360	100527	BENZALDEHYDE
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF TOLUENE
		52 CHLORINATION OF TOLUENE + HYDROLYSIS OF BENZAL CHLORIDE
*370	55210	BENZAMIDE
		0 UNSPECIFIED PROCESS
		51 ACYLATION OF AMMONIA WITH BENZOYL CHLORIDE
375	56553	BENZO(A)ANTHRACENE
		51 COMBUSTION PRODUCT
*380	71432	BENZENE
		51 PETROLEUM DERIVED (INCLUDES PROCESSES 53-56)
		52 COAL DERIVED
		53 CATALYTIC REFORMING
		54 PYROLYSIS GASOLINE
		55 HYDRODEALKYLATION
		56 TOLUENE DISPROPORTIONATION

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*390	98488	BENZENEDISULFONIC ACID (M) 51 DIRECT SULFONATION OF BENZENE SULFONIC ACID
*400	98113	BENZENESULFONIC ACID 51 SULFONATION OF BENZENE
405	92875	BENZIDINE 51 REDUCTION OF NITROBENZENE, THEN ACID TREATMENT
*410	134816	BENZIL 0 UNSPECIFIED PROCESS 51 OXIDATION OF BENZOIN
*420	76937	BENZILIC ACID 0 UNSPECIFIED PROCESS 51 REARRANGEMENT OF BENZIL
423	205992	3:4-BENZOFLUORANTHENE 51 COMBUSTION PRODUCT
426	207089	11,12-BENZOFLUORANTHENE 51 COMBUSTION PRODUCT
*430	65850	BENZOIC ACID 51 DERIVED FROM TOLUENE BY OXIDATION
*440	119539	BENZOIN 0 UNSPECIFIED PROCESS 51 CONDENSATION OF BENZALDEHYDE
445	50328	BENZO(A)PYRENE 51 COMBUSTION PRODUCT
*450	100470	BENZONITRILE 0 UNSPECIFIED PROCESS 51 AMMONOLYSIS OF TOLUENE 52 FLUID BED AMMOXIDATION

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
485	191242	1'12-BENZOPERYLENE 51 COMBUSTION PRODUCT
4460	119619	BENZOPHENONE 0 UNSPECIFIED PROCESS 51 FRIEDEL-CRAFTS-BENZENE + CCL4
4480	98077	BENZOTRICHLORIDE 51 CHLORINATION OF TOLUENE
4490	98884	BENZOYL CHLORIDE 0 UNSPECIFIED PROCESS 51 BENZOIC ACID + BENZOTRICHLORIDE
495	94360	BENZOYL PEROXIDE 0 UNSPECIFIED PROCESS 51 BENZOYL CHLORIDE AND SODIUM PEROXIDE
4500	100516	BENZYL ALCOHOL 0 UNSPECIFIED PROCESS 51 HYDROLYSIS OF BENZYL CHLORIDE 52 CATALYTIC REDUCTION OF BENZALDEHYDE
4510	100469	BENZYLAMINE 51 AMMONOLYSIS OF BENZYL CHLORIDE
4520	120514	BENZYL BENZOATE 0 UNSPECIFIED PROCESS 51 ESTERIFICATION OF BENZOIC ACID + BENZYL ALCOHOL 52 CANNIZZARO REACTION WITH BENZALDEHYDE
4530	100447	BENZYL CHLORIDE 51 CHLORINATION OF TOLUENE
4540	98873	BENZYL DICHLORIDE 51 CHLORINATION OF TOLUENE

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
542	319846	BHC-ALPHA 51 CHLORINATION OF BENZENE
544	319857	BHC-BETA 51 CHLORINATION OF BENZENE
546	58899	BHC-GAMMA 0 UNSPECIFIED 51 CHLORINATION OF BENZENE
548	319868	BHC-DELTA 51 CHLORINATION OF BENZENE
*550	92524	BIPHENYL 0 UNSPECIFIED PROCESS 51 THERMAL DEHYDROGENATION OF BENZENE 52 BYPRODUCT OF TOLUENE DEALKYLATION
552	111911	BIS(2-CHLOROETHOXY)METHANE 51 FORMALDEHYDE AND ETHYLENE CHLOROHYDRIN
554	39638329	BIS(2'CHLOROISOPROPYL)ETHER 0 UNSPECIFIED 51 BYPRODUCT OF CHLOROHYDRIN PROCESS FOR PROPYLENE OXIDE
556	542881	BIS(CHLOROMETHYL)ETHER 51 CHLORINE AND METHYL ETHER 52 HCL AND FORMALDEHYDE;THEN DEHYDRATION
558	117817	BIS(2-ETHYLHEXYL) PHTHALATE 0 UNSPECIFIED 51 ESTERIFICATION
*560	80057	BISPHENOL A 51 FROM ACETONE AND PHENOL

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
578	108861	BROMOBENZENE
		51 BROMINATION OF BENZENE
575	75252	BROMOFORM
		0 UNSPECIFIED PROCESS
		51 ACETONE OR ETHANOL AND BROMINE IN BASIC MEDIUM
*580	27497514	BROMONAPHTHALENE
		51 BROMINATION OF NAPHTHYLENE
582	101553	4-BROMOPHENYL PHENYL ETHER
		51 UNKNOWN
*590	106990	BUTADIENE
		51 HOUDRY AND ETHYLENE BY-PRODUCT
		52 OXIDATIVE DEHYDROGENATION OF N-BUTENES
		53 ETHYLENE BY-PRODUCT
		54 HOUDRY
		55 HOUDRY MODIFIED WITH OXIDATIVE DEHYDROGENATION
		56 OXIDATIVE DEHYDROGENATION AND ETHYLENE BY-PRODUCT
*592		N-BUTENE
		0 UNSPECIFIED PROCESS
		51 REFINERY GAS
		52 ETHYLENE BY-PRODUCT
		53 N-BUTANE DEHYDROGENATION
		55 BY-PRODUCT OF ALPHA OLEFINS
*600	123864	N-BUTYL ACETATE
		51 ESTERIFICATION
*630	141322	N-BUTYLACRYLATE
		0 UNSPECIFIED PROCESS
		51 MODIFIED REPPE
		52 KETENE
		53 CYANOHYDRIN
		54 PROPYLENE OXIDATION

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		55 ESTERIFICATION
*640	71363	N-BUTYL ALCOHOL
		51 ALDOL CONDENSATION
		52 OXO PROCESS
		53 ZIEGLER-ALFOL
*650	78922	SEC-BUTYL ALCOHOL
		51 SULFURIC ACID ABSORPTION AND HYDRATION OF N-BUTENES
*660	75650	TERT-BUTYL ALCOHOL
		51 CATALYTIC ADDITION OF AMMONIA TO ISOBUTYL ALCOHOL
		52 BY-PRODUCT OF PROPYLENE OXIDE
*670	109739	N-BUTYLAMINE
		0 UNSPECIFIED PROCESS
		51 HYDROGENATION OF N-BUTYRALDEHYDE + ALCOHOLIC AMMONIA
		52 REACTION OF AMMONIA + N-BUTYL ALCOHOL
*680	13952846	SEC-BUTYLAMINE
		51 REACTION OF ISOBUTYLENE AND TOLUENE THEN OXIDATION
*690	75649	TERT-BUTYLAMINE
		0 UNSPECIFIED PROCESS
		51 ISOBUTYLENE AND HCN
		52 TERTIARY BUTYL ALCOHOL AND AMMONIA
*700	98737	P-TERT-BUTYLBENZOIC ACID
		51 ESTERIFICATION
705	85687	BUTYL BENZYL PHTHALATE
		51 NEUTRALIZATION
*710	107880	1,3-BUTYLENE GLYCOL
		0 UNSPECIFIED PROCESS
		51 HYDROGENATION OF ACETALDOL
720		BUTYLENES
		0 UNSPECIFIED PROCESS

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		51 REFINERY GAS
		52 ETHYLENE BY-PRODUCT
		53 N-BUTANE DEHYDROGENATION
		54 DEHYDRATION OF TERT-BUTYL ALCOHOL
		55 BY-PRODUCT OF ALPHAOLEFINS
		56 BOTH 51 AND 52
725	109795	BUTYL MERCAPTANS
		0 UNSPECIFIED PROCESS
		51 UNKNOWN
727	85701	BUTYL PHTHALYL BUTYL GLYCOLATE
		0 UNKNOWN
		51 ESTERIFICATION
729	84786	BUTYLOCTYL PHTHALATE
		0 UNKNOWN
		51 ESTERIFICATION
730	27178343	TERT-BUTYLPHENOL
		51 PHENOL + ISOBUTYLENE-ACID OR FRIEDEL-CRAFTS CATALYSTS
*750	123728	N-BUTYRALDEHYDE
		0 UNSPECIFIED PROCESS
		51 OXO PROCESS
		52 HYDROGENATION OF CROTONALDEHYDE
		53 BYPRODUCT OF ACETIC ACID PRODUCTION FROM N-BUTANE
*760	107926	N-BUTYRIC ACID
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF BUTYRALDEHYDE
		52 BYPRODUCT OF ACETIC ACID PRODUCTION FROM N-BUTANE
*770	106310	N-BUTYRIC ANHYDRIDE
		0 UNSPECIFIED PROCESS
		51 EXCHANGE BETWEEN BUTYRIC ACID AND ACETIC ANHYDRIDE
		52 BUTYRIC ACID AND KETENE

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*780	109740	N-BUTYRONITRILE
		0 UNSPECIFIED PROCESS
		51 N-PROPYL CHLORIDE AND HCN
784	1592230	CALCIUM STEARATE
		52 BASF PROCESS
*785	105602	CAPROLACTAM
		51 PHENOL-CONVENTIONAL
		52 CYCLOHEXANE-CONVENTIONAL
		53 CYCLOHEXANE-DSM/HPO (STAMICARBON)
*790	75150	CARBON DISULFIDE
		51 VAPOR PHASE SULFUR + METHANE
*800	558134	CARBON TETRABROMIDE
		0 UNSPECIFIED PROCESS
		51 CCL4 + ALBR3
*810	56235	CARBON TETRACHLORIDE
		51 COPRODUCTION PERCHLOROETHYLENE BY THERMAL CHLORINATION
		52 CHLORINATION OF METHANE
		53 CHLORINATION OF CARBON DISULFIDE
		54 CHLORINATION OF PROPANE
812	75730	CARBON TETRAFLUORIDE
		51 FLUORINATION OF CCL4
815	8001794	CASTOR OIL
		51 NATURAL PRODUCT
817	9005816	CELLOPHANE
		51 ALKALI CELLULOSE TREATED WITH CARBON DISULFIDE
818	9004346	CELLULOSE(ALPHA GRADES & DISSOLVING)
		0 UNKNOWN
		51 FROM WOOD PULP OR COTTON LINTING OR OTHER NATURAL FIBERS

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
819	904368	CELLULOSE ACETATE BUTYRATE
		0 UNKNOWN
		51 ACETIC ANHYDRIDE,CELLULOSE AND BUTYRIC ACID
*820	9004357	CELLULOSE ACETATE
		51 ESTERIFICATION OF CELLULOSE AND ACETIC ACID
821	9004391	CELLULOSE ACETATE PROPIONATE
		0 UNKNOWN
		51 ACETIC ANHYDRIDE, CELLULOSE & PROPIONIC ACID
822		CELLULOSE DERIVATIVES
824	9004700	CELLULOSE NITRATE
		51 NITRATION
826		CELLULOSE SPONGE
		51 FROM VISCOSE CELLULOSE SYRUP
830	107200	CHLOROACETALDEHYDE
		51 UNKNOWN
*840	79118	CHLOROACETIC ACID
		51 CHLORINATION OF ACETIC ACID
845	1341248	CHLOROACETOPHENONE
		0 UNSPECIFIED PROCESS
		51 CHLOROACETYLCHLORIDE,BENZENE,+ALUMINUM CHLORIDE
*850	108429	M-CHLOROANILINE
		0 UNSPECIFIED PROCESS
		51 REDUCTION OF M-NITROCHLOROBENZENE
		52 TREATMENT OF ANILINE IN H2SO4 WITH CL2
*860	95512	O-CHLOROANILINE
		0 UNSPECIFIED PROCESS
		51 ACETANILIDE, ACETIC ACID,CL2; THEN DIL. ACID

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*870	106478	P-CHLOROANILINE
		0 UNSPECIFIED PROCESS
		51 ACETANILIDE, ACETIC ACID,CL2; THEN DIL. ACID
*880	35913098	CHLOROBENZALDEHYDE
		0 UNSPECIFIED PROCESS
		51 HYDROLYSIS OF CHLOROBENZALCHLORIDE FROM P-CHLOROTOLUENE
*890	108907	CHLOROBENZENE
		51 CHLORINATION OF BENZENE
*900		CHLOROBENZOIC ACID AND ESTERS
		0 UNSPECIFIED PROCESS
		51 O,P-CHLORINATION OF CHLOROTOLUENES, THEN HYDROLYSIS
		52 M-CHLORINATION OF BENZOIC ACID
*905		CHLOROBENZOTRICHLORIDE (O,P)
		51 CHLORINATION OF CHLOROTOLUENES
*910	1321035	CHLOROBENZOYL CHLORIDE
		0 UNSPECIFIED PROCESS
		51 CHLOROBENZOIC ACID + CHLOROBENZOTRICHLORIDE
915	12789036	CHLORDANE
		51 HEXACHLOROCYCLOPENTADIENE + CYCLOPENTADIENE, THEN CL2
*920	25497294	CHLORODIFLUOROETHANE
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF 1,1-DIFLUOROETHANE
*921	75456	CHLORODIFLUOROMETHANE
		0 UNSPECIFIED PROCESS
		51 FLUORINATION OF CHLOROFORM
923	124481	CHLORODIBROMOMETHANE
		51 UNKNOWN

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
925	110758	2-CHLOROETHYL VINYL ETHER (MIXED)
		51 UNKNOWN
*930	67663	CHLOROFORM
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF METHANE
		52 HYDROCHLORINATION OF METHANOL
		53 BOTH 51 & 52
935		CHLOROMETHANES
937	59507	4-CHLORO-3-METHYL PHENOL
		0 UNSPECIFIED PROCESS
		51 UNKNOWN
*940	25586430	CHLORONAPHTHALENE
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF NAPHTHALENE
945	91587	2-CHLORONAPHTHALENE
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF NAPHTHALENE
*950	88733	O-CHLORONITROBENZENE
		0 UNSPECIFIED PROCESS
		51 NITRATION OF CHLOROBENZENE
*951	100005	P-CHLORONITROBENZENE
		0 UNSPECIFIED PROCESS
		51 NITRATION OF CHLOROBENZENE
*960	25167800	CHLOROPHENOLS
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF PHENOL
961	95578	2-CHLOROPHENOL
		0 UNSPECIFIED PROCESS

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		51 CHLORINATION OF PHENOL
963		4-CHLOROPHENYL PHENYLETHER
		51 UNKNOWN
*964	126998	CHLOROPRENE
		51 CHLORINATION OF BUTADIENE
*965	7790945	CHLOROSULFONIC ACID
		0 UNSPECIFIED PROCESS
		51 SO3 + HCL
*970	108418	M-CHLOROTOLUENE
		0 UNSPECIFIED PROCESS
		51 DIAZOTIZATION OF M-TOLUIDINE
*980	95498	O-CHLOROTOLUENE
		51 CHLORINATION OF TOLUENE
*990	106434	P-CHLOROTOLUENE
		51 CHLORINATION OF TOLUENE
*992	75729	CHLOROTRIFLUOROMETHANE
		0 UNSPECIFIED PROCESS
		51 FLUORINATION OF CCL4
		52 PYROLYSIS OF CHLORODIFLUOROMETHANE
993	67481	CHOLINE CHLORIDE
		0 UNSPECIFIED PROCESS
		51 FROM TRIMETHYLAMINE + ETHYLENE CHLOROHYDRIN OR OXIDE
995	218019	CHRYSENE
		51 COAL TAR, COMBUSTION PRODUCT
996	106229	CITRONELLOL
		51 REACTION OF CITRONELLAL OR GERANIOL
997	8007452	COAL TAR
		51 COKING

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
999		COUMARONE-INDENE RESINS
		51 POLYMERIZATION OF HEAVY NAPHTHA
*1000	108394	M-CRESOL
		0 UNSPECIFIED PROCESS
		51 NAPHTHA CRACKING
		52 COKING BYPRODUCTS
		53 METHYLATION OF PHENOL
*1010	95487	O-CRESOL
		0 UNSPECIFIED PROCESS
		51 NAPHTHA CRACKING
		52 COKING BYPRODUCTS
		53 METHYLATION OF PHENOL
*1020	106445	P-CRESOL
		0 UNSPECIFIED PROCESS
		51 NAPHTHA CRACKING
		52 COKING BYPRODUCTS
		53 METHYLATION OF PHENOL
		54 SULFONATION OF TOLUENE
*1021	1319773	CRESOLS MIXED
		0 UNSPECIFIED PROCESS
		51 NAPHTHA CRACKING
		52 COKING BYPRODUCTS
		53 METHYLATION OF PHENOL
*1030	1319773	CRESYLIC ACID
		51 BY-PRODUCT OF NAPTHA CRACKING PROCESS FOR PETROLEUM
		52 BY-PRODUCT OF COAL TAR
		53 CATALYZED METHYLATION OF PHENOL
*1040	4170300	CROTONALDEHYDE
		51 ALDOL CONDENSATION OF ACETALDEHYDE

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*1050	3724650	CROTONIC ACID
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF CROTONALDEHYDE
*1060	98828	CUMENE
		51 ALKYLATION OF BENZENE
*1070	80159	CUMENE HYDROPEROXIDE
		51 OXIDATION OF CUMENE
*1080	372098	CYANOACETIC ACID
		0 UNSPECIFIED PROCESS
		51 SODIUM CHLOROACETATE + SODIUM CYANIDE
*1090	506774	CYANOGEN CHLORIDE
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF HYDROGEN CYANIDE
*1100	108805	CYANURIC ACID
		51 THERMAL DECOMPOSITION OF UREA
*1110	108770	CYANURIC CHLORIDE
		0 UNSPECIFIED PROCESS
		51 POLYMERIZATION OF CYANOGEN CHLORIDE
*1120	110827	CYCLOHEXANE
		51 HYDROGENATION OF BENZENE
		52 FROM NATURAL GASOLINE
		53 BOTH 51 & 52
*1130	108930	CYCLOHEXANOL
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF CYCLOHEXANE
		52 HYDROGENATION OF PHENOL
*1140	108941	CYCLOHEXANONE
		51 OXIDATION OF CYCLOHEXANE

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		52 HYDROGENATION OF PHENOL
*1150	110838	CYCLOHEXENE
		0 UNSPECIFIED PROCESS
		51 DEHYDRATION OF CYCLOHEXANOL
		52 DEHYDROHALOGENATION OF HALOCYCLOHEXANES
*1160	108918	CYCLOHEXYLAMINE
		0 UNSPECIFIED PROCESS
		51 REDUCTION OF ANILINE
		52 REDUCTIVE AMINATION OF CYCLOHEXANONE
*1170	111784	1,5-CYCLOOCTADIENE
		51 DIMERIZATION OF BUTADIENE
1172	72548	4,4'-DDD
		51 CHLORINATION OF ETOH & CONDENSATION WITH CHLOROBENZENE
1174	72559	4,4'-DDE
		51 DEGRADATION OF DDT
1176	50293	4,4'-DDT
		51 CONDENSATION OF CHLORAL + CHLOROBENZENE
*1180	112301	DECANOL
		0 UNSPECIFIED PROCESS
		51 OXO PROCESS
		52 ALFOL PROCESS
		53 REDUCTION OF ESTERS
		54 SAPONIFICATION OF ESTERS
		55 ALDOL CONDENSATION
		56 PARAFFIN OXIDATION
*1190	123422	DIACETONE ALCOHOL
		51 CONDENSATION OF ACETONE
1195	25035150	DIALLYL PHTHALATE RESINS
		51 ALLYL ALCOHOL + PHTHALIC ANHYDRIDE

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
1196	53703	1,2,5,6-DIBENZANTHRACENE
		51 COMBUSTION PRODUCT
1197	84742	DI-N-BUTYL PHTHALATE
		51 ESTERIFICATION
*1200	27576041	DIAMINOBENZOIC ACID
		0 UNSPECIFIED PROCESS
		51 REDUCTION OF DINITROBENZOIC ACIDS
*1210		DICHLOROANILINE
		0 UNSPECIFIED PROCESS
		51 REDUCTION OF DICHLORONITROBENZENE
1212	84684	2,2'-DICHLOROBENZIDINE
		51 UNKNOWN
1213	91941	3,3'-DICHLOROBENZIDINE
		51 UNKNOWN
1214		2,3'-DICHLOROBENZIDINE
		51 UNKNOWN
*1215	541731	M-DICHLOROBENZENE
		51 ISOMERIZATION OF O OR P ISOMERS
*1216	95501	O-DICHLOROBENZENE
		51 CHLORINATION OF BENZENE
*1220	106467	P-DICHLOROBENZENE
		51 CHLORINATION OF BENZENE
*1221	75718	DICHLORODIFLUOROMETHANE
		51 REPLACEMENT-CCL4 + SBF5
1225	75343	1,1-DICHLOROETHANE
		51 UNKNOWN

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
1235	156592	1,2-DICHLOROETHYLENE (CIS)
		51 CHLORINATION OF ACETYLENE
1236	540590	1,2-TRANS-DICHLOROETHYLENE
		51 UNKNOWN
*1240	111444	DICHLOROETHYL ETHER
		0 UNSPECIFIED PROCESS
		51 ETHYLENE CHLOROHYDRIN + SULFURIC ACID
		52 CHLORINATION OF ETHYL ETHER
		53 AQ.ETHYLENE CHLOROHYDRIN, CHLORINE, ETHYLENE
1243	75274	DICHLOROBROMOMETHANE
		51 UNKNOWN
*1244	107062	1,2-DICHLOROETHANE
		0 UNSPECIFIED
		51 BALANCED PROCESS
		52 OXYCHLORINATION AND DIRECT CHLORINATION
		53 DIRECT CHLORINATION
1246	542881	DICHLOROMETHYL ETHER
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF METHYL ETHER
		52 HCL + FORMALDEHYDE
*1250	96231	DICHLOROHYDRIN
		0 UNSPECIFIED PROCESS
		51 GLYCEROL + HCL
		52 INTERMEDIATE IN GLYCERINE PRODUCTION
		53 CHLORINATION OF ALLYL ALCOHOL
		54 CHLOROHYDRINATION OF ALLYL CHLORIDE
1265	120832	2,4-DICHLOROPHENOL
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF PHENOL

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
1266	78999	1,1-DICHLOROPROPANE
		51 ACETONE AND PCL5
1268		2,2-DICHLOROPROPANE
		51 UNKNOWN
*1270	26952238	DICHLOROPROPENE
		0 UNSPECIFIED PROCESS
		51 BYPRODUCT OF ALLYL CHLORIDE PRODUCTION
1271	542756	1,3-DICHLOROPROPENE
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF PROPYLENE
1272		1,1-DICHLOROPROPENE
		51 HIGH-TEMPERATURE REACTION OF PROPYLENE & CHLORINE
1273		1,2-DICHLOROPROPENE (CIS)
		51 HIGH-TEMPERATURE REACTION OF PROPYLENE & CHLORINE
1274		1,2-DICHLOROPROPENE (TRANS)
		51 HIGH-TEMPERATURE REACTION OF PROPYLENE & CHLORINE
1275	1320372	DICHLOROTETRAFLUOROETHANE
		0 UNSPECIFIED PROCESS
		51 PERCHLOROETHYLENE, CHLORINE + HF
		52 FROM DIFLUOROETHANE
1276		1,3-DICHLOROPROPENE (CIS)
		51 HIGH -TEMPERATURE REACTION OF PROPYLENE & CHLORINE
1277		1,3-DICHLOROPROPENE (TRANS)
		51 HIGH-TEMPERATURE REACTION OF PROPYLENE & CHLORINE
*1280	101837	DICYCLOHEXYLAMINE
		0 UNSPECIFIED PROCESS
		51 CATALYTIC HYDROGENATION OF ANILINE

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
1281	84775	DIDECYL PHTHALATE 51 ESTERIFICATION
1283	60571	DIELDRIN 51 EPOXIDATION OF ALDRIN
*1290	109897	DIETHYLAMINE 51 ETHANOL + AMMONIA
*1300	111466	DIETHYLENE GLYCOL 51 HYDRATION OF ETHYLENE OXIDE
*1304	112367	DIETHYLENE GLYCOL DIETHYL ETHER 51 ETHYLENE GLYCOL MONOETHYL ETHER + CHLOROETHANE
*1305	111966	DIETHYLENE GLYCOL DIMETHYL ETHER 0 UNSPECIFIED PROCESS 51 ETHYLENE GLYCOL MONOMETHYL ETHER + CHLOROMETHANE
*1310	112345	DIETHYLENE GLYCOL MONOBUTYL ETHER 51 ETHYLENE OXIDE AND BUTANOL
*1320	124174	DIETHYLENE GLYCOL MONOBUTYL ETHER ACETATE 0 UNSPECIFIED PROCESS 51 ESTERIFICATION WITH ACETIC ACID
*1330	111900	DIETHYLENE GLYCOL MONOETHYL ETHER 0 UNSPECIFIED PROCESS 51 ETHYLENE OXIDE AND ETHANOL
*1340	112152	DIETHYLENE GLYCOL MONOETHYL ETHER ACETATE 0 UNSPECIFIED 51 ESTERIFICATION WITH ACETIC ACID
*1360	111773	DIETHYLENE GLYCOL MONOMETHYL ETHER 51 ETHYLENE OXIDE AND METHANOL

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
1380	84662	DIETHYL PHTHALATE
		51 ESTERIFICATION
1385	84753	DI-N-HEXYL PHTHALATE
		0 UNKNOWN
		51 ESTERIFICATION
1390	117840	DI-N-OCTYL PHTHALATE
		51 ESTERIFICATION
*1420	64675	DIETHYL SULFATE
		0 UNSPECIFIED PROCESS
		51 SULFURIC ACID + ETHYLENE
*1430	75376	DIFLUOROETHANE
		0 UNSPECIFIED PROCESS
		51 ADDITION OF HF TO ACETYLENE
*1440	25167708	DIISOBUTYLENE
		51 OLIGOMERIZATION OF ISOBUTYLENE
1441	84695	DI-ISOBUTLYL PHTHALATE
		0 UNKNOWN
		51 ESTERIFICATION
*1442	26761400	DIISODECYL PHTHALATE
		51 ESTERIFICATION
*1444	27554263	DIISOOCTYL PHTHALATE
		0 UNKNOWN
		51 ESTERIFICATION
1446	108189	DIISOPROPYL AMINE
		51 ISOPROPYL CHLORIDE + AMMONIA
*1450	674828	DIKETENE
		51 SPONTANEOUS POLYMERIZATION OF KETENE

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*1460	124403	DIMETHYLAMINE
		51 METHANOL AND AMMONIA
1465	108010	2-DIMETHYL AMINOETHANOL
		0 UNSPECIFIED PROCESS
		51 ETHYLENE OXIDE AND DIMETHYLAMINE
*1470	121697	N,N-DIMETHYLANILINE
		0 UNSPECIFIED PROCESS
		51 ANILINE + METHANOL
*1480	115106	DIMETHYL ETHER
		0 UNSPECIFIED PROCESS
		51 METHANOL + SULFURIC ACID
		52 COPRODUCT OF FORMALDEHYDE
*1490	68122	N,N-DIMETHYLFORMAMIDE
		51 METHYL FORMATE + DIMETHYLAMINE
*1495	57147	1,1-DIMETHYL HYDRAZINE
		0 UNSPECIFIED PROCESS
		51 DIMETHYLAMINE AND CHLORAMINE
		52 OXIDATION OF DIMETHYLAMINE + AMMONIA
1496	105679	2,4-DIMETHYL PHENOL
		0 UNSPECIFIED PROCESS
		51 FRACTIONATION OF SODIUM CARBOLATE
		52 METHYLATION OF PHENOL
1497	131113	DIMETHYL PHTHALATE
		51 ESTERIFICATION
*1500	77781	DIMETHYL SULFATE
		0 UNSPECIFIED PROCESS
		51 DIMETHYL ETHER + SULFUR TRIOXIDE

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*1510	75183	DIMETHYL SULFIDE
		0 UNSPECIFIED PROCESS
		51 METHANOL + CARBON DISULFIDE
*1520	67685	DIMETHYL SULFOXIDE
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF DIMETHYL SULFIDE WITH NO2
*1530	120616	DIMETHYL TEREPHTHALATE
		51 OXIDATION OF P-XYLENE
1535	25154545	DINITROBENZENES
		51 NITRATION OF NITROBENZENE
*1540	99343	3,5-DINITROBENZOIC ACID
		0 UNSPECIFIED PROCESS
		51 NITRATION OF BENZOIC ACID
1543	534521	4,6-DINITRO-O-CRESOL
		51 UNKNOWN
*1545	51285	2,4-DINITROPHENOL
		0 UNSPECIFIED PROCESS
		51 NITRATION OF PHENOL
1550	25321146	DINITROTOLUENE
		51 NITRATION OF TOLUENE
*1551	121142	2,4-DINITROTOLUENE
		51 NITRATION OF TOLUENE
*1552	606202	2,6-DINITROTOLUENE
		51 NITRATION OF TOLUENE
1553	602017	2,3-DINITROTOLUENE
		51 NITRATION OF TOLUENE

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
1554	619158	2,5-DINITROTOLUENE
		51 NITRATION OF TOLUENE
1555	610399	3,4-DINITROTOLUENE
		51 NITRATION OF NITROTOLUENE
*1556		3,5-DINITROTOLUENE
		51 NITRATION OF NITROTOLUENE
1557	122667	1,2-DIPHENYLHYDRAZINE
		51 UNKNOWN
1558	530507	N,N-DIPHENYLHYDRAZINE
		51 REDUCTION OF N,N-DIPHENYL NITROSAMINES
*1560	123911	DIOXANE
		0 UNSPECIFIED PROCESS
		51 FROM ETHYLENE GLYCOL
*1570	646060	DIOXOLANE
		0 UNSPECIFIED PROCESS
		51 FORMALDEHYDE + ETHYLENE GLYCOL
*1580	122394	DIPHENYLAMINE
		0 UNSPECIFIED PROCESS
		51 CONDENSATION OF ANILINE
1587	101815	DIPHENYL METHANE
		0 UNSPECIFIED PROCESS
		51 CONDENSATION OF BENZYL BENZENE + BENZENE
1589	84628	DIPHENYL PHTHALATE
		0 UNKNOWN
		51 ESTERIFICATION
*1590	101848	DIPHENYL OXIDE
		0 UNSPECIFIED PROCESS

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		51 CHLOROBENZENE + PHENOL
		52 BYPRODUCT OF PHENOL FROM CHLOROBENZENE
*1600	102089	DIPHENYLTHIOUREA
		0 UNSPECIFIED PROCESS
		51 ANILINE, CS2, ALCOHOL IN PRESENCE OF SULFUR
*1610	25265718	DIPROPYLENE GLYCOL
		0 UNSPECIFIED PROCESS
		51 HYDRATION OF PROPYLENE OXIDE
		52 BYPRODUCT OF PROPYLENE GLYCOL PRODUCTION
		53 ADDITION OF PROPYLENE OXIDE TO PROPYLENE GLYCOL
1615	119062	DI-TRIDECYL PHTHALATE
		0 UNKNOWN
		51 ESTERIFICATION
*1620	25378227	DODECENE
		51 POLYMERIZATION OF PROPYLENE
*1630	28675174	DODECYLANILINE
		0 UNSPECIFIED PROCESS
		51 UNKNOWN
1635	112550	DODECYL MERCAPTAN
		0 UNSPECIFIED PROCESS
		51 UNKNOWN
*1640	27193868	DODECYLPHENOL
		51 ALKYLATION OF PHENOL
1642	959988	ENDOSULFAN-ALPHA
		0 UNSPECIFIED
		51 CIS-2-BUTENE AND HEXACHLOROCYCLOPENTADIENE (HEX)
1643	33213659	ENDOSULFAN-BETA
		0 UNSPECIFIED
		51 CIS-2-BUTENE AND HEXACHLOROCYCLOPENTADIENE (HEX)

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
1644	1031078	ENDOSULFAN SULFATE
		51 CIS-2-BUTENE AND HEXACHLOROCYCLOPENTADIENE (HEX)
1646	72208	ENDRIN
		51 EPOXIDATION OF ALDRIN WITH PERACETIC ACID
1647	74934	ENDRIN ALDEHYDE
		51 PHOTOISOMERIZATION OF ENDRIN
1648	53494705	ENDRIN KETONE
		51 PHOTOISOMERIZATION OF ENDRIN
*1650	106898	EPICHLOROHYDRIN
		51 CHLOROHYDRINATION OF ALLYL CHLORIDE PRODUCED FROM PROPYLENE
1653		EPOXIDIZED ESTERS
1656		EPOXY RESINS
		0 UNSPECIFIED PROCESS
		51 EPOXIDATION
		52 CONDENSATION OF EPICHLOROHYDRIN WITH POLYOLS
*1660	64175	ETHANOL-SYNTHETIC
		0 UNSPECIFIED PROCESS
		51 HYDRATION OF ETHYLENE
		52 FERMENTATION
		53 OXO PROCESS
		54 BYPRODUCT OF OXIDATION OF N-BUTANE FOR ACETIC ACID
*1661		ETHANOLAMINES
		51 ETHYLENE OXIDE + AMMONIA
*1670	141786	ETHYL ACETATE
		0 UNSPECIFIED PROCESS
		51 ESTERIFICATION
		52 BYPRODUCT OF N-BUTANE OXIDATION

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*1680	141979	ETHYL ACETOACETATE
		0 UNSPECIFIED PROCESS
		51 ETHYL ACETATE + SODIUM OR SODIUM ETHOXIDE
*1690	140885	ETHYL ACRYLATE
		51 ESTERIFICATION
		52 MODIFIED REPPE
		53 PROPYLENE OXIDATION
*1700	75047	ETHYLAMINE
		51 ETHANOL & AMMONIA
*1710	100414	ETHYLBENZENE
		0 UNSPECIFIED PROCESS
		51 ALKYLATION OF BENZENE WITH ETHYLENE
		52 FROM MIXED XYLENE STREAMS
		53 BYPRODUCT OF CUMENE MANUFACTURE
		54 BOTH 51 & 52
*1720	74964	ETHYL BROMIDE
		51 ETHYLENE & HYDROGEN BROMIDE
*1730	9004573	ETHYL CELLULOSE
		51 ETHYL CHLORIDE & CELLULOSE
*1740	75003	ETHYL CHLORIDE
		0 UNSPECIFIED PROCESS
		51 HYDROCHLORINATION OF ETHYLENE
		52 CHLORINATION OF ETHANE
		53 BOTH 51 & 52
*1750	105395	ETHYL CHLOROACETATE
		0 UNSPECIFIED PROCESS
		51 ESTERIFICATION OF CHLOROACETIC ACID + ETHANOL
*1760	105566	ETHYLCYANOACETATE
		0 UNSPECIFIED PROCESS

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		51 ESTERIFICATION OF CYANOACETIC ACID + ETHANOL
*1770	74851	ETHYLENE
		0 UNSPECIFIED PROCESS
		51 PYROLYSIS OF ETHANE/PROPANE/BUTANE
		52 PYROLYSIS OF GAS OIL OR NAPHTHA
		53 PYROLYSIS OF ETHANE/PROPANE & REFINERY GAS
		54 MIXED FEEDSTOCKS
		55 FROM REFINERY GAS
*1780	96491	ETHYLENE CARBONATE
		0 UNSPECIFIED PROCESS
		51 ETHYLENE OXIDE AND CARBON DIOXIDE
*1790	107073	ETHYLENE CHLOROHYDRIN
		51 ETHYLENE & HYPOCHLORUS ACID
*1800	107153	ETHYLENE DIAMINE
		51 ETHYLENE DICHLORIDE & AMMONIA
*1810	106934	ETHYLENE DIBROMIDE
		51 ADDITION OF BROMINE TO ETHYLENE
*1830	107211	ETHYLENE GLYCOL
		0 UNSPECIFIED PROCESS
		51 HYDRATION OF ETHYLENE OXIDE FROM OXIDATION OF ETHYLENE
		52 ETHYLENE + ACETIC ACID; THEN HYDROLYSIS
		53 ETHYLENE + HYPOCHLOROUS ACID
*1840	111557	ETHYLENE GLYCOL DIACETATE
		0 UNSPECIFIED PROCESS
		51 ESTERIFICATION
*1870	110714	ETHYLENE GLYCOL DIMETHYL ETHER
		0 UNSPECIFIED PROCESS
		51 ETHYLENE GLYCOL MONOMETHYL ETHER + METHYL CHLORIDE
*1890	111762	ETHYLENE GLYCOL MONOBUTYL ETHER
		51 ETHYLENE OXIDE & BUTANOL

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*1900	112072	ETHYLENE GLYCOL MONOBUTYL ETHER ACETATE 0 UNSPECIFIED PROCESS 51 ESTERIFICATION WITH ACETIC ACID
*1910	110805	ETHYLENE GLYCOL MONOETHYL ETHER 51 ETHYLENE OXIDE & ETHANOL
*1920	111159	ETHYLENE GLYCOL MONOETHYL ETHER ACETATE 0 UNSPECIFIED PROCESS 51 ESTERIFICATION WITH ACETIC ACID
*1930	109864	ETHYLENE GLYCOL MONOMETHYL ETHER 51 ETHYLENE OXIDE & METHANOL
*1940	110496	ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE 0 UNSPECIFIED PROCESS 51 ESTERIFICATION WITH ACETIC ACID
*1960	122996	ETHYLENE GLYCOL MONOPHENYL ETHER 0 UNSPECIFIED PROCESS 51 ETHYLENE OXIDE + PHENOL
*1970	2807309	ETHYLENE GLYCOL MONOPROPYL ETHER 51 ETHYLENE OXIDE & PROPANOL
*1980	75218	ETHYLENE OXIDE 0 UNSPECIFIED PROCESS 51 OXIDATION OF ETHYLENE 52 CHLOROHYDRIN PROCESS (OBSOLETE)
1985	24937788	ETHYLENE-VINYL ACETATE COPOLYMERS 0 UNSPECIFIED 51 EMULSION POLYMERIZATION
*1990	60297	ETHYL ETHER 0 UNSPECIFIED PROCESS 51 COPRODUCT OF DIRECT HYDRATION OF ETHYLENE FOR ETHANOL

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		52 INDIRECT HYDRATION OF ETHYLENE WITH SULFUMIC ACID
1995	149575	ETHYLHEXANOIC ACID
		0 UNSPECIFIED PROCESS
		51 SAPONIFICATION OF GYLCERIDES,AND PURIFICATION
*2000	104767	2-ETHYL HEXANOL
		51 OXO PROCESS
2007	75081	ETHYL MERCAPTAN
		0 UNSPECIFIED PROCESS
		51 ETHYLENE AND HYDROGEN SULFIDE
*2010	122510	ETHYL ORTHOFORMATE
		0 UNSPECIFIED PROCESS
		51 HCN, ETHANOL, + HCL
*2020	95921	ETHYL OXALATE
		51 ESTERIFICATION
*2030		ETHYL SODIUM OXALACETATE
		0 UNSPECIFIED PROCESS
		51 ETHYL ACETATE, DIETHYLOXALATE, + SODIUM ETHOXIDE
2033	206440	FLUORANTHENE
		51 COMBUSTION PRODUCT
2035		FLUOROCARBON POLYMERS
		51 TYPICAL POLYMERIZATION PROCESS
2037	86737	FLUORENE
		51 COMBUSTION PRODUCT
		52 COAL TAR ISOLATE
*2040	50000	FORMALDEHYDE
		51 OXIDATION OF METHANOL
*2050	75127	FORMAMIDE
		0 UNSPECIFIED PROCESS

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		51 AMMONIA + METHYL FORMATE
*2060	64186	FORMIC ACID
		0 UNSPECIFIED PROCESS
		51 BYPRODUCT OF ACETIC ACID FROM BUTANE
*2070	110178	FUMARIC ACID
		51 ISOMERIZATION OF MALEIC ACID
		52 FROM MALEIC ANHYDRIDE
		53 BY-PRODUCT OF PHTHALIC ANHYDRIDE PROD.
*2073	98011	FURFURAL
		51 HYDROLYSIS OF PETOSANS FROM AGRICULTURAL RESIDUES
2075	106241	GERANIOL
		0 UNSPECIFIED PROCESS
		51 FROM CITRONELLA + PALMEROSA OILS
		52 FROM PINENE
2080	142472	GLUTAMIC ACID, MONOSODIUM SALT
		0 UNSPECIFIED PROCESS
		51 FERMENTATION
		52 EXTRACTION FROM NATURAL SOURCES
*2090	56815	GLYCEROL (NATURAL + SYNTHETIC)
		51 REFINED NATURAL GLYCEROL
		52 ALLYL CHLORIDE-EPICHLOROHYDRIN
		53 ALLYL ALCOHOL-PERACETIC ACID
		54 ACROLEIN-ALLYL ALCOHOL
*2091	26545733	GLYCEROL DICHLORUHYDRIN
		0 UNSPECIFIED PROCESS
		51 GLYCERUL + HCL
*2100	25791962	GLYCEROL TRI(POLYOXYPROPYLENE)ETHER
		0 UNSPECIFIED PROCESS
		51 GLYCERUL + PROPYLENE OXIDE

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
2105	556525	GLYCIDOL
		0 UNSPECIFIED PROCESS
		51 MONOCHLOROHYDRIN + BASE
		52 ALLYL ALCOHOL + PERACETIC ACID
*2110	56406	GLYCINE
		0 UNSPECIFIED PROCESS
		51 AMMONOLYSIS OF CHLOROACETIC ACID
*2120	107222	GLYOXAL
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF ACETALDEHYDE
2130	76448	HEPTACHLOR
		51 CHLORINATION OF CHLORDENE
2135		HEPTACHLOR EPOXIDE
		51 DEGRADATION PRODUCT OF HEPTACHLOR
2137		N-HEPTYL-NONYL-UNDECYL PHTHALATE
		51 ESTERIFICATION
2140	25339564	HEPTENE
		51 POLYMERIZATION OF C3-C4 REFINERY GASES
*2145	118741	HEXACHLOROBENZENE
		51 BYPRODUCT FROM PRODUCTION OF CHLORINE AND CHLORINATED ORGANICS
2147	87683	HEXACHLOROBUTADIENE
		0 UNSPECIFIED PROCESS
		51 FRIEDEL-CRAFTS CONDENSATION OF TRICHLOROETHYLENE
2148		HEXACHLOROCYCLOHEXANE (MIXED ISOMERS)
		0 UNKNOWN
		51 CHLORINATION OF BENZENE

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
2109	77474	HEXACHLOROCYCLOPENTADIENE
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF PENTANES
*2150	67721	HEXACHLOROETHANE
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF PERCHLOROETHYLENE
*2160	36653824	HEXADECYL ALCOHOL
		0 UNSPECIFIED PROCESS
		51 REDUCTION OF ESTERS
		52 ALFOL PROCESS
		53 MODIFIED ZIEGLER PROCESS
*2165	124094	HEXAMETHYLENEDIAMINE
		0 UNSPECIFIED PROCESS
		51 FROM HEXANEDIOL
		52 FROM BUTADIENE
		53 FROM ACRYLONITRILE
		54 FROM ADIPIC ACID
*2170	629118	HEXAMETHYLENE GLYCOL
		0 UNSPECIFIED
		51 CATALYTIC REDUCTION OF DIETHYL ADIPATE
*2180	100970	HEXAMETHYLENE TETRAMINE
		51 CONDENSATION OF FORMALDEHYDE & AMMONIA
2181		N-HEXYL-2-ETHYLHEXYL-ISOOCTYL PHTHALATE
		51 ESTERIFICATION
2182		N-HEXYL-2-ETHYLHEXYL PHTHALATE
		51 ESTERIFICATION
2183		N-HEXYL-OCTYL-DECYL PHTHALATE
		0 UNKNOWN
		51 ESTERIFICATION

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
2185		HYDRAZINE SOLUTIONS
		0 UNSPECIFIED PROCESS
		51 AMMONIA AND SODIUM HYPOCHLORITE
*2190	74908	HYDROGEN CYANIDE
		0 UNSPECIFIED PROCESS
		51 BYPRODUCT OF ACRYLONITRILE
		52 AMMONIA, AIR, METHANE
*2200	123319	HYDROQUINONE
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF ALKYLATED BENZENE
		52 OXIDATION OF ANILINE; THEN REDUCTION OF P-BENZOQUINONE
*2210	99967	P-HYDROXYBENZOIC ACID
		0 UNSPECIFIED PROCESS
		51 P-AMINOBENZOIC ACID + NITROUS ACID
2215		HYDROXYETHYL TEREPHTHALATE
		51 UNKNOWN
2217	9004620	HYDROXYETHYL CELLULOSE
		0 UNKNOWN
		51 ETHYLENE OXIDE AND CELLULOSE
2218	9004624	HYDROXYPROPYL CELLULOSE
		0 UNKNOWN
		51 PROPYLENEOXIDE AND CELLULOSE
2220	111422	2,2-IMINODIETHANOL
		0 UNSPECIFIED PROCESS
		51 ETHYLENE OXIDE + AMMONIA
2230	8013909	IONONE
		51 CONDENSATION OF CITRAL

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
2235	193395	INDENO(1,2,3-C,D)PYRENE 51 COMBUSTION PRODUCT
*2240	26760645	ISOAMYLENE 0 UNSPECIFIED PROCESS 51 EXTRACTION FROM CATALYTICALLY CRACKED GASOLINE STREAM
*2250	78831	ISOBUTANOL 51 HYDROGENATION OF ISOBUTYRALDEHYDE FROM OXO PROCESS
*2260	110190	ISOBUTYL ACETATE 51 ESTERIFICATION
*2261	115117	ISOBUTYLENE 0 UNSPECIFIED PROCESS 51 EXTRACTION FROM A MIXTURE OF C-4 HYDROCARBONS 52 N-BUTANE DEHYDROGENATION 53 DEHYDRATION OF TERT-BUTYL ALCOHOL 54 BY-PRODUCT OF ETHYLENE PRODUCTION
*2270	78842	ISOBUTYRALDEHYDE 51 OXO PROCESS
*2280	79312	ISOBUTYRIC ACID 0 UNSPECIFIED PROCESS 51 OXIDATION OF ISOBUTYRALDEHYDE
*2300	25339177	ISODECANOL 51 OXO PROCESS
*2320	26952216	ISOOCTYL ALCOHOL 51 OXO PROCESS
*2321	78784	ISOPENTANE 51 FROM PETROLEUM OR NATURAL GAS LIQUIDS

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*2330	78591	ISOPHORONE
		51 CONDESATION OF ACETONE
*2340	121915	ISOPHTHALIC ACID
		51 OXIDATION OF M-XYLENE
*2350	78795	ISOPRENE
		51 EXTRACTION FROM A MIXTURE OF C-5 HYUROCARBONS
		52 ACETONITRILE SOLVENT EXTRACTION
		53 ISOAMYLENE DEHYDROGENATION
*2360	67630	ISOPROPANOL
		51 SULFURIC ACID ABSORPTION OF PROPYLENE
		52 CATALYTIC HYDROGENATION OF ACETONE
*2370	108214	ISOPROPYL ACETATE
		0 UNSPECIFIED PROCESS
		51 ESTERIFICATION
*2380	75310	ISOPROPYLAMINE(MONO)
		0 UNSPECIFIED PROCESS
		51 AMMONIA + ISOPROPYL ALCOHOL
*2390	75296	ISOPROPYL CHLORIDE
		0 UNSPECIFIED
		51 ISOPROPANOL + HYDROCHLORIC ACID
2395	108203	ISOPROPYL ETHER
		0 UNSPECIFIED
		51 BYPRODUCT OF ISOPROPYL ALCOHOL PRODUCTION
*2400	25168063	ISOPROPYL PHENOL
		0 UNSPECIFIED PROCESS
		51 FRIEDEL-CRAFTS-ISOPROPYL CHLORIDE + PHENOL
*2410	463514	KETENE
		0 UNSPECIFIED PROCESS

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		51 PYROLYSIS OF ACETONE
		52 DEHYDRATION OF ACETIC ACID
*2414		LINEAR ALKYLATE SULFONATE
		51 SULFONATION OF LINEAR ALKYLBENZENE
*2417		LINEAR ALKYLBENZENE
		0 UNSPECIFIED
		51 MONOCHLOROPARAFFIN & ALUMINUM CHLORIDE & BENZENE
		52 INTERNAL OLEFINS & HYDROGEN FLUORIDE & BENZENE
*2420	110167	MALEIC ACID
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF BENZENE
		52 OXIDATION OF BUTANE
		53 BYPRODUCT OF PHTHALIC ANHYDRIDE
*2430	108316	MALEIC ANHYDRIDE
		51 OXIDATION OF BENZENE
		52 OXIDATION OF N-BUTANE
		53 PHTHALIC ANHYDRIDE BY-PRODUCT
*2440	6915157	MALIC ACID
		51 HYDRATION OF MALEIC ACID
2442		MELAMINE
		51 DSM PROCESS
2443		MELAMINE-FORMALDEHYDE RESINS
		51 CONTROLLED POLYMERIZATION OF MELAMINE & FURMALDEHYDE
*2450	141797	MESITYL OXIDE
		51 DEHYDRATION OF DIACETONE ALCOHOL
*2455	121471	METANILIC ACID
		0 UNSPECIFIED PROCESS
		51 REDUCTION OF M-NITROBENZENE SULFONIC ACID

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
#2460	79414	METHACRYLIC ACID
		51 FROM ACETONE CYANOHYDRIN
#2490	563473	METHALLYL CHLORIDE
		51 ISOBUTYLENE & CHLORINE
#2500	67561	METHANOL
		0 UNSPECIFIED PROCESS
		51 HIGH PRESSURE PROCESS
		52 ICI LOW PRESSURE PROCESS
		53 BYPRODUCT OF POLYESTER PRODUCTION
#2510	79209	METHYL ACETATE
		0 UNSPECIFIED PROCESS
		51 ESTERIFICATION
		52 BYPRODUCT OF ACETIC ACID FROM BUTANE
#2520	105453	METHYL ACETOACETATE
		0 UNSPECIFIED PROCESS
		51 METHYL ACETATE + SODIUM
#2530	74895	METHYLAMINE
		51 AMMONIA & METHANOL
#2540	100618	N-METHYLANILINE
		0 UNSPECIFIED PROCESS
		51 ANILINE + METHANOL
		52 ANILINE + METHYL IODIDE
#2545	74839	METHYL BROMIDE
		51 METHANOL & HBR
2547	591786	METHYL BUTYL KETONE
		0 UNSPECIFIED PROCESS
		51 HYDRATION OF 2-HEXYNE

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*2550	37365712	METHYL BUTYNOL
		51 ACETYLENE AND FORMALDEHYDE
*2560	74873	METHYL CHLORIDE
		51 FROM METHANE
		52 FROM METHANOL
*2570	108872	METHYLCYCLOHEXANE
		0 UNSPECIFIED PROCESS
		51 REDUCTION OF TOLUENE
*2590	1331222	METHYLCYCLOHEXANONE
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF METHYLCYCLOHEXANOL
*2620	75092	METHYLENE CHLORIDE
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF METHANE
		52 CHLORINATION OF METHANOL
		53 BOTH 51 & 52
*2630	101779	METHYLENE DIANILINE
		51 CONDENSATION OF ANILINE & FORMALDEHYDE
*2635	101688	METHYLENE DIPHENYL DIISOCYANATE
		51 PHOSGENATION OF METHYLENE DIANILINE
*2640	78933	METHYL ETHYL KETONE
		0 UNSPECIFIED PROCESS
		51 DEHYDROGENATION OF SEC-BUTYL ALCOHOL
		52 BUTANE OXIDATION FOR ACETIC ACID
*2645	107313	METHYL FORMATE
		0 UNSPECIFIED PROCESS
		51 METHANOL + SYN GAS

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
2647	1335462	METHYLIONONES
		51 CONDENSATION OF CITRAL WITH MEK, THEN CYCLIZATION
*2650	108112	METHYL ISOBUTYL CARBINOL
		0 UNSPECIFIED PROCESS
		51 COPRODUCT OF METHYL ISOBUTYL KETONE
		52 HYDROGENATION OF METHYL ISOBUTYL KETONE
*2660	108101	METHYL ISOBUTYL KETONE
		51 HYDROGENATION OF MESITYL OXIDE
2662	74931	METHYL MERCAPTAN
		0 UNSPECIFIED PROCESS
		51 METHANOL + HYDROGEN SULFIDE
*2665	80626	METHYL METHACRYLATE
		51 REACTION OF ACETONE AND HYDROGEN CYANIDE
		52 DISTILLATION OF CRUDE MONOMER PRODUCED AT OTHER LOCATION
*2670	77758	METHYLPENTYNOL
		0 UNSPECIFIED PROCESS
		51 ACETYLATION OF 2-BUTANONE
2680	119368	METHYL SALICYLATE
		51 ESTERIFICATION
*2690	98839	A-METHYLSTYRENE
		51 DEHYDROGENATION OF CUMENE
		52 BY-PRODUCT OF PHENOL & CUMENE PRODN.
*2700	110918	MORPHOLINE
		0 UNSPECIFIED PROCESS
		51 DEHYDRATION OF DIETHANOLAMINE
2701	91203	NAPHTHALENE
		51 COAL DERIVED
		52 PETROLEUM DERIVED

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*2710	85472	A-NAPHTHALENE SULFONIC ACID
		0 UNSPECIFIED PROCESS
		51 SULFONATION OF NAPHTHALENE
*2720	120183	B-NAPHTHALENE SULFONIC ACID
		0 UNSPECIFIED PROCESS
		51 SULFONATION OF NAPHTHALENE
*2730	90153	A-NAPHTHOL
		0 UNSPECIFIED PROCESS
		51 FUSION OF A-NAPHTHALENE SULFONATE + CAUSTIC SODA
*2740	135193	B-NAPHTHOL
		51 PEROXIDATION OF 2-ALKYL NAPHTHALENE
*2750	75989	NEOPENTANOIC ACID
		0 UNSPECIFIED PROCESS
		51 CARBOXYLATION OF ISOBUTYLENE
		52 TERT-BUTYL ALCOHOL, H_2SO_4, + FORMIC ACID
*2756	88744	O-NITROANILINE
		0 UNSPECIFIED PROCESS
		51 NITRATION OF ANILINE AFTER ACETYLATION
*2757	100016	P-NITROANILINE
		0 UNSPECIFIED PROCESS
		51 AMMONOLYSIS OF P-CHLORONITROBENZENE
*2760	91236	O-NITROANISOLE
		0 UNSPECIFIED PROCESS
		51 METHYLATION OF O-NITROPHENOL
*2762	100174	P-NITROANISOLE
		0 UNSPECIFIED PROCESS
		51 METHYLATION OF P-NITROPHENOL

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*2770	98953	NITROBENZENE
		51 NITRATION OF BENZENE
*2780		NITROBENZOIC ACID (M,O,P)
		0 UNSPECIFIED PROCESS
		51 OXIDATION OF NITROTOLUENE
*2790	79243	NITROETHANE
		0 UNSPECIFIED PROCESS
		51 NITRIC ACID + PROPANE
*2791	75525	NITROMETHANE
		0 UNSPECIFIED PROCESS
		51 NITRIC ACID + PROPANE
*2792	88755	2-NITROPHENOL
		0 UNSPECIFIED PROCESS
		51 NITRATION OF PHENOL
2793	824782	P-NITROPHENOL AND SODIUM SALT
		0 UNSPECIFIED PROCESS
		51 P-NITROPHENOL + SODIUM HYDROXIDE
*2794	100027	4-NITROPHENOL
		0 UNKNOWN
		51 NITRATION OF PHENOL
		52 HYDROLYSIS OF P-NITROCHLOROBENZENE
*2795	25322014	NITROPROPANE
		0 UNSPECIFIED PROCESS
		51 NITRATION OF PROPANE
*2800	1321126	NITROTOLUENE
		51 NITRATION OF TOLUENE
2805	86306	N-NITROSODIPHENYLAMINE
		0 UNSPECIFIED PROCESS

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		51 UNKNOWN
2806	62759	N-NITROSODIMETHYLAMINE
		51 UNKNOWN
2808	621647	N-NITROSODIPROPYLAMINE
		51 UNKNOWN
*2810	27215958	NONENE
		51 POLYMERIZATION OF PROPYLENE
*2820	25154523	NONYLPHENOL
		51 ALKYLATION OF PHENOL
2821	25038544	NYLON 6
		51 RESIN FROM CAPROLACTAM
		52 RESIN FROM FIBER WASTE
		53 FIBER
		54 MONOFILAMENT
2822	32131172	NYLON 66
		51 RESIN FROM ADIPIC ACID & HMDA
		52 RESIN FROM WASTE FIBER
		53 FIBER
		54 MONOFILAMENT
2823	38775370	NYLON 69
		51 RESIN FROM PELARGONIC ACID & HMDA
2824	25035045	NYLON 11
		51 RESIN FROM 11-AMINOUNDECANOIC ACID
		54 MONOFILAMENT
2825	24937164	NYLON 12
		51 RESIN FROM LAURYLLACTAM
		54 MONOFILAMENT
2826	13184688	NYLON 612
		51 RESIN FROM DODECANOIC ACID & HMDA

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		54 MONOFILAMENT
2827	117817	OCTYL DI(2-ETHYLHEXYL) PHTHALATE
		51 ESTERIFICATION
*2828	27193288	OCTYLPHENOL
		0 UNSPECIFIED PROCESS
		51 ALKYLATION OF PHENOL WITH ISOBUTYLENE DIMER
2831		OXO CHEMICALS (MISC.)
		51 OXO PROCESS
2832	1336363	POLYCHLORINATED BIPHENYLS (MISC.)
		51 CHLORINATION OF BIPHENYL
2833	53469219	PCB-1242
2834		PCB-1016
		51 CHLORINATION OF BIPHENYL
2835	12672296	PCB-1248
2836	11104282	PCB-1221
		51 CHLORINATION OF BIPHENYL
2837	11097691	PCB-1254
2838	11141165	PCB-1232
2839	11096825	PCB-1260
*2840	123637	PARALDEHYDE
		0 UNSPECIFIED PROCESS
		51 POLYMERIZATION OF ACETALDEHYDE
2841	608935	PENTACHLOROBENZENE
		51 CHLORINATION OF TETRACHLOROBENZENE
		52 SMALL QUANTITIES IN HEATING TRICHLOROETHYLENE

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OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
2042	76017	1,1,1,2,2-PENTACHLOROETHANE 01 CHLORINATION OF TRICHLOROETHYLENE
2043	87865	PENTACHLOROPHENOL 01 CHLORINATION OF PHENOL OR CHLOROPHENOLS
42050	115775	PENTAERYTHRITOL 01 CONDENSATION OF FORMALDEHYDE & ACETALDEHYDE
42051	109660	N-PENTANE 01 PETROLEUM DISTILLATION
42055	109671	1-PENTENE 0 UNSPECIFIED PROCESS 01 FROM NATURAL GASOLINE
42060	127184	PERCHLOROETHYLENE 0 UNSPECIFIED PROCESS 01 CHLORINATION OF ETHYLENE DICHLORIDE 02 CHLORINATION OF C1+C2+C3 03 CHLORINATION OF PROPYLENE + PROPYLENE DICHLORIDE 04 CHLORINATION OF STILL BOTTOMS AND RESIDUES 05 FROM ACETYLENE 06 FROM TRICHLOROETHYLENE 07 FROM VARIOUS FEEDSTOCKS
42062	594423	PERCHLOROMETHYL MERCAPTAN 0 UNSPECIFIED PROCESS 01 CHLORINATION OF CARBON DISULFIDE
2066	85018	PHENANTHRENE 01 COMBUSTION PRODUCTS FROM COAL TAR
42070	94702	P-PHENETIDINE 01 ETHYLATION + REDUCTION OF P-NITROPHENOL

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CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*2900	156434	P-PHENETIDINE
		0 UNSPECIFIED PROCESS
		51 ETHYLATION + REDUCTION OF P-NITROPHENOL
2905		PHENOLIC RESINS
		51 POLYMERIZATION OF PHENOL & FORMALDEHYDE
*2910	108952	PHENOL
		51 CUMENE PEROXIDATION
		52 COAL TAR AND PETROLEUM
		53 TOLUENE OXIDATION
		54 COAL TAR
		55 PETROLEUM
		56 BENZENE SULFONATION
*2920		PHENOLSULFONIC ACIDS
		0 UNSPECIFIED PROCESS
		51 DIRECT SULFONATION OF PHENOL
2925		PHENOXY RESINS
		51 COPOLYMER OF BISPHENOL A & EPICHLORUHYDRIN
*2930	91407	PHENYLANTHRANILIC ACID
		0 UNSPECIFIED PROCESS
		51 UNKNOWN
*2940		PHENYLENEDIAMINE
		0 UNSPECIFIED PROCESS
		51 REDUCTION OF DINITROBENZENE
2945		2+3-O-PHENYLENEPYRENE
		51 COMBUSTION PRODUCT
*2950	75445	PHOSGENE
		51 CARBON MONOXIDE & CHLORINE

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OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
2951		C6-C10 PHTHALATE
		51 ESTERIFICATION
2955		C10-C12 PHTHALATE
		51 ESTERIFICATION
*2960	85449	PHTHALIC ANHYDRIDE
		51 FROM O-XYLENE
		52 FROM COAL-TAR NAPTHALENE
		53 FROM PETROLEUM NAPTHALENE
		54 FROM DESULFURIZED NAPTHALENE
*2970	85416	PHTHALIMIDE
		51 AMMONIA & PHTHALIC ANHYDRIDE
*2973	108996	B-PICOLINE
		0 UNSPECIFIED PROCESS
		51 ACETALDEHYDE + AMMONIA
		52 RECOVERY FROM COKE-OVEN GAS
*2976	110850	PIPERAZINE
		0 UNSPECIFIED PROCESS
		51 ETHANOLAMINES + AMMONIA
		52 FROM ETHYLENEDIAMINES OR OTHER HIGHER AMINES
2980		PHTHALIC ACID ESTERS (PLASTICIZERS)
		51 ESTERIFICATION
2990	30846298	POLYACETAL RESINS
		51 ADDITION OF ALDEHYDE MOLECULES THROUGH C=O GROUP
2992		POLY-ALPHA-METHYL STYRENE
		51 IONIC POLYMERIZATION OF A-METHYL STYRENE
2994		POLYARYL ETHER
		51 OXIDATIVE COUPLING OF PHENOLIC MONOMERS

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OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
2996		POLYAMIDES
		51 CYCLOADDITION OF MONOBASIC FATTY ACIDS
2998	26985659	POLYBENZIMIDAZOLES
		51 3,3'-DIAMINOBENZIDINE + DIPHENYLISOPHTHALATE
*3000		POLYBUTENES
		0 UNSPECIFIED PROCESS
		51 POLYMERIZATION OF ISOBUTYLENES/BUTYLENES STREAM
3002		POLYBENZOTHIAZOLES
		51 UNKNOWN
3004		POLYCARBONATES
		51 PHOSGENATION OF BISPHENOL A
3005	25038599	POLYETHYENE TEREPHTHALATE
		51 RESIN
		52 FILM
		53 FIBERS
3007	9002884	HIGH DENSITY POLYETHYLENE
		0 UNSPECIFIED PROCESS
		51 SOLUTION POLYMERIZATION
		52 SLURRY POLYMERIZATION
3009	9002884	LOW DENSITY POLYETHYLENE
		0 UNSPECIFIED PROCESS
		51 HIGH PRESSURE, GAS PHASE
*3010	25322683	POLYETHYLENE GLYCOL
		51 ETHYLENE GLYCOL + ETHYLENE OXIDE
3012		POLYIMIDES
		0 UNSPECIFIED PROCESS
		51 PMDA + AROMATIC DIAMINES
		52 BTDA + AROMATIC DIAMINES

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OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		53 TMA + AROMATIC DIAMINES
		54 TMA + DIACETOXY DERIVATIVE OF AN AROMATIC DIOL
3014	25068262	4-METHYL-1-POLYMETHYL PENTENE
		51 UNKNOWN
3016	9016755	POLYPHENYLENE SULFIDE
		0 UNSPECIFIED PROCESS
		51 SODIUM SULFIDE + N-METHYL PYRROLIDONE
3020	9003070	POLYPROPYLENE AND COPOLYMERS RESIN/FIBER
		0 UNSPECIFIED PROCESS
		51 SLURRY POLYMERIZATION
		52 SOLUTION POLYMERIZATION
*3025	25322694	POLYPROPYLENE GLYCOL
		51 PROPYLENE GLYCOL + PROPYLENE OXIDE
3030	9003536	POLYSTYRENE AND COPOLYMERS
		0 UNSPECIFIED PROCESS
		51 SOLUTION POLYMERIZATION
		52 SUSPENSION POLYMERIZATION
		53 MODIFIED MASS POLYMERIZATION
		54 EMULSION POLYMERIZATION
3033		POLYSULFONE RESINS
		0 UNSPECIFIED PROCESS
		51 CONDENSATION OF BISPHENOL A + DICHLOROPHENYL SULFONE
3036	27416860	POLYURETHANE RESINS
		51 FOAM
		52 RESINS
		53 SURFACE COATING RESINS
		54 ELASTOMERS
		55 CONDENSATION OF POLYHYDRIC ALCOHOLS + DIISOCYANATES
3040		POLYVINYL ACETATE AND COPOLYMERS
		0 UNSPECIFIED PROCESS
		51 EMULSION POLYMERIZATION

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OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		52 SUSPENSION POLYMERIZATION
3042	9002895	POLYVINYL ALCOHOL
		51 HYDROLYSIS OF POLYVINYL ACETATE
3044		POLYVINYL BUTYRAL
		51 CONDENSATION OF BUTYRALDEHYDE WITH POLYVINYL ACETATE
3046		POLYVINYL CARBAZOLE
		51 ACETYLENE + CARBAZOLE
3047	9002862	POLYVINYL CHLORIDE
		0 UNSPECIFIED
		51 SUSPENSION POLYMERIZATION
		52 EMULSION POLYMERIZATION
		53 BULK POLYMERIZATION
		54 SOLUTION POLYMERIZATION
3049		PVC COPOLYMERS
		0 UNSPECIFIED
3050		POLYVINYL ETHERS
		51 POLYMERIZATION OF VINYL ETHERS
3055	9003398	POLYVINYL PYRROLIDONE
		0 UNSPECIFIED PROCESS
		51 SOLUTION POLYMERIZATION
3060	9002851	POLYVINYLIDENE CHLORIDES
		0 UNSPECIFIED PROCESS
		51 SUSPENSION POLYMERIZATION
		52 EMULSION POLYMERIZATION
*3063	123386	PROPIONALDEHYDE
		51 OXO PROCESS
*3066	79094	PROPIONIC ACID
		51 BY-PRODUCT OF N-BUTANE OXIDATION FOR ACETIC ACID
		52 OXO PROCESS

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OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		58 NITROPARAFFIN BY-PRODUCT
3068	109604	PROPYL ACETATE
		0 UNSPECIFIED PROCESS
		51 ESTERIFICATION
*3070	71238	N-PROPYL ALCOHOL
		0 UNSPECIFIED PROCESS
		51 OXO PROCESS
		52 BYPRODUCT OF N-BUTANE OXIDATION FOR ACETIC ACID
*3075	107108	PROPYLAMINE
		0 UNSPECIFIED PROCESS
		51 AMMONIA + PROPANOL
		52 AMMONIA + PROPYL CHLORIDE
*3080	540545	PROPYL CHLORIDE
		0 UNSPECIFIED PROCESS
		51 PROPYL ALCOHOL + HCL
*3090	115071	PROPYLENE
		0 UNSPECIFIED PROCESS
		51 FROM ETHYLENE MANUFACTURING
		52 FROM REFINING OPERATIONS
		53 FROM REFINING AND ETHYLENE MANUFACTURE
*3100	127004	PROPYLENE CHLOROHYDRIN
		0 UNSPECIFIED PROCESS
		51 HYDROCHLORINATION OF PROPYLENE
*3110	78875	PROPYLENE DICHLORIDE
		0 UNSPECIFIED PROCESS
		51 BYPRODUCT OF PROPYLENE OXIDE BY CHLOROHYDRINATION
*3111	57556	PROPYLENE GLYCOL
		51 HYDRATION OF PROPYLENE OXIDE
*3120	75569	PROPYLENE OXIDE
		51 CHLOROHYDRIN

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		52 PEROXIDATION (ISOBUTANE)
		53 PEROXIDATION (ETHYLBENZENE)
3125	129000	PYRENE
		51 COAL TAR; COMBUSTION PRODUCT
*3130	110861	PYRIDINE (NATURAL AND SYNTHETIC)
		51 RECOVERY FROM COKE OVEN GAS
		52 ACETALDEHYDE + AMMONIA
*3140	106514	QUINONE
		51 OXIDATION OF ANILINE
3145	61788770	RAYON
		51 ALKALI CELLULOSE + CARBON DISULFIDE
*3150	108463	RESORCINOL
		51 SULFONATION PROCESS
*3160	27138574	RESORCYLIC ACID
		0 UNSPECIFIED PROCESS
		51 UNKNOWN
*3170	69727	SALICYLIC ACID
		51 SODIUM PHENATE + CARBON DIOXIDE
3175		SILICONES
		0 UNSPECIFIED PROCESS
		51 FLUIDS-HYDROLYSIS OF DIMETHYLDICHLOROSILANE
		52 ELASTOMERS-RING OPENING OF CYCLIC SILOXANES
		53 RESINS-HYDROLYSIS OF ORGANOCHLOROSILANES
*3180	127093	SODIUM ACETATE
		0 UNSPECIFIED PROCESS
		51 NEUTRALIZATION
*3181	532321	SODIUM BENZOATE
		0 UNSPECIFIED PROCESS
		51 NEUTRALIZATION

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*3260	126330	SULFOLANE
		51 SULFUR DIOXIDE + BUTADIENE
*3270	1401554	TANNIC ACID
		51 EXTRACTION FROM NATURAL SOURCES
*3280	100210	TEREPHTHALIC ACID
		0 UNSPECIFIED
		51 OXIDATION OF P-XYLENE
		52 HYDROLYSIS OF DMT
3283	25167208	TETRABROMOETHANE
		0 UNSPECIFIED PROCESS
		51 ACETYLENE + BROMINE
3285	1746016	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN
		51 CONTAMINANT IN PESTICIDES
3286	634662	1,2,3,4-TETRACHLOROBENZENE
		51 CHLORINATION OF 1,2,3-TRICHLOROBENZENE
3287	634902	1,2,3,5-TETRACHLOROBENZENE
		51 CHLORINATION OF 1,3,5-TRICHLOROBENZENE
		52 SANDMEYER FROM 2,3,5-TRICHLOROANILINE
3289	95943	1,2,4,5-TETRACHLOROBENZENE
		0 UNKNOWN
		51 CHLORINATION OF BENZENE
		52 CHLORINATION OF 1,2,4-TRICHLOROBENZENE
		53 SANDMEYER FROM 1,2,4-TRICHLOROBENZENE
*3290	79345	1,1,2,2-TETRACHLOROETHANE
		51 CHLORINATION OF ACETYLENE
3291		1,1,1,2-TETRACHLOROETHANE
		51 CHLORINATION OF ACETYLENE

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*3350	95807	TOLUENE-2,4-DIAMINE
		51 REDUCTION OF 2,4-DINITROTOLUENE
*3354	584849	2,4-TOLUENE DIISOCYANATE
		51 PHOSGENATION OF TOLUENE-2,4-DIAMINE
*3355	26471625	TOLUENE DIISOCYANATES (MIXTURE)
		51 PHOSGENATION OF TOLUENE DIAMINE
*3360	1333079	TOLUENESULFONAMIDE
		0 UNSPECIFIED PROCESS
		51 TOLUENE SULFONYL CHLORIDE + AMMONIA
*3370		TOLUENESULFONIC ACIDS
		51 SULFONATION OF TOLUENE
*3380	98599	TOLUENESULFONYL CHLORIDE
		0 UNSPECIFIED
		51 SULFONATION OF TOLUENE, THEN PCL5
		52 TOLUENE + CHLOROSULFONIC ACID
*3381	26915128	TOLUIDINES
		0 UNSPECIFIED PROCESS
		51 REDUCTION OF NITROTOLUENES
3385	8001352	TOXAPHENE
		51 CHLORINATION OF A-PINENE
*3390	87616	1,2,3-TRICHLOROBENZENE
		51 CHLORINATION OF O-DICHLOROBENZENE
3391	108703	1,3,5-TRICHLOROBENZENE
		51 CHLORINATION OF M-DICHLOROBENZENE
*3393	120821	1,2,4-TRICHLOROBENZENE
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF O-DICHLOROBENZENE

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*3395	71556	1,1,1-TRICHLOROETHANE
		51 CHLORINATION OF VINYL CHLORIDE
		52 HYDROCHLORINATION OF VINYLIDENE CHLORIDE
		53 CHLORINATION OF ETHANE
*3400	79005	1,1,2-TRICHLOROETHANE
		0 UNSPECIFIED PROCESS
		51 OXYCHLORINATION OF ETHYLENE DICHLORIDE
		52 ACETYLENE CHLORINATION, DEHYDROCHLORINATION OF PRODUCT
		53 CHLORINATION + DEHYDROCHLORINATION OF EDC
*3410	79016	TRICHLOROETHYLENE
		0 UNSPECIFIED PROCESS
		51 FROM ACETYLENE
		52 FROM ETHYLENE DICHLORIDE
*3411	75694	TRICHLOROFLUOROMETHANE
		51 FLUORINATION OF CARBON TETRACHLORIDE
3415	88062	2,4,6-TRICHLOROPHENOL
		0 UNSPECIFIED PROCESS
		51 UNKNOWN
*3420	96184	1,2,3-TRICHLOROPROPANE
		0 UNSPECIFIED PROCESS
		51 CHLORINATION OF PROPYLENE
*3430	76131	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE
		0 UNSPECIFIED PROCESS
		51 PERCHLOROETHYLENE, CL2, HF
*3450	121448	TRIETHYLAMINE
		51 ETHANOL + AMMONIA
*3460	112276	TRIETHYLENE GLYCOL
		51 HYDRATION OF ETHYLENE OXIDE

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
*3470	112492	TRIETHYLENE GLYCOL DIMETHYL ETHER
		0 UNSPECIFIED PROCESS
		51 SODIUM SALT OF TRIETHYLENE GLYCOL MONOETHER + CH_3Cl
3475	112243	TRIETHYLENE TETRAAMINE
		51 UNKNOWN
*3480	7756947	TRIISOBUTYLENE
		51 POLYMERIZATION OF ACID EXTRACT OF ISOBUTYLENES
*3490	75503	TRIMETHYLAMINE
		51 AMMONIA + METHANOL
*3500	57136	UREA
		0 UNSPECIFIED PROCESS
		51 AMMONIA + CARBON DIOXIDE, ONCE THROUGH
		52 AMMONIA + CARBON DIOXIDE; PARTIAL RECYCLE
		53 AMMONIA + CARBON DIOXIDE; TOTAL RECYCLE
		54 BOTH 51 & 53
3501	9011056	UREA FORMALDEHYDE RESIN
		51 CONDENSATION OF UREA + FORMALDEHYDE
*3510	108054	VINYL ACETATE
		51 ACETYLENE PROCESS
		52 VAPOR-PHASE ETHYLENE PROCESS
*3520	75014	VINYL CHLORIDE
		0 UNSPECIFIED
		51 BALANCED ETHYLENE DICHLORIDE PROCESS
		52 DIRECT CHLORINATION OF ETHYLENE
		53 FROM ACETYLENE
		54 ETHYLENE OXYCHLORINATION
*3530	75354	VINYLIDENE CHLORIDE
		0 UNSPECIFIED PROCESS
		51 FROM 1,1,1-TRICHLOROETHANE

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
		52 FROM 1,1,2-TRICHLOROETHANE
*3540	25013154	VINYL TOLUENE
		51 ALKYLATION OF TOLUENE; THEN DEHYDROGENATION OF M + P
*3541	1330207	XYLENES (MIXED)
		0 UNSPECIFIED PROCESS
		51 FROM REFORMATE
		52 FROM PYROLYSIS GASOLINE
		53 BYPRODUCT OF COKING
		54 DISPROPORTIONATION + HYDRODEALKYLATION OF TOLUENE
		55 BOTH 51 & 53
		56 BOTH 51 & 52
		57 BOTH 51 & 54
*3550	108383	M-XYLENE
		0 UNSPECIFIED
		51 FRACTIONAL CRYSTALLIZATION FROM MIXTURE
		52 FORMATION OF CLATHRATES
		53 SULFONATION
		54 FORMATION OF HF-BF3 COMPLEX
*3560	95476	O-XYLENE
		0 UNSPECIFIED PROCESS
		51 FRACTIONAL DISTILLATION
*3570	106423	P-XYLENE
		0 UNSPECIFIED PROCESS
		51 FRACTIONAL CRYSTALLIZATION
		52 ADSORPTION
*3580	1300716	XYLENOL (MIXTURE)
		0 UNSPECIFIED PROCESS
		51 METHYLATION OF PHENOL
		52 FRACTIONATION OF SODIUM CARBOLATE
3587	25321419	XYLENE SULFONIC ACID
		51 UNKNOWN

ORGANIC CHEMICAL PRODUCERS DATA BASE

CHEMICALS AND PROCESSES

OCPDB NUMBER	CAS NUMBER	CHEMICAL/PROCESS
43590	1300738	XYLIDINE
		0 UNSPECIFIED PROCESS
		51 REDUCTION OF NITROXYLENES

APPENDIX B

OCPDB DEFINITION

OCPDB Definition

```
80/12/17. 10.31.32. BEGIN SYSTEM 2000  VERSION 2.70D
---
USER,CHTJOBN IS CPDB)
-556-   ASSIGNED   CPDB                    92  1249 80/05/21. 12.01.18.
---
DESCRIBE)
 SYSTEM RELEASE NUMBER       2.70D
 DATA BASE NAME IS CPDB
 DEFINITION NUMBER      92
 DATA BASE CYCLE      1249
    1*  ENTRY TYPE (INTEGER NUMBER 9)
    2*  ENTRY ID (INTEGER NUMBER 9(5))
 1000*  PRODUCT DESCRIPTION (RG)
   1001*  PRODUCT (NAME X(25) IN 1000)
   1002*  CAS NUMBER (INTEGER NUMBER 9(10) IN 1000)
   1003*  NEW IN DB FLAG (NAME X IN 1000)
   1004*  CONFIDENTIAL PRODUCT FLAG (NAME X IN 1000)
   1005*  PRIORITY POLLUTANT FLAG (NAME X IN 1000)
   1006*  WISWESSER LINE NOTATION (NAME X(40) IN 1000)
   1007*  NIOSH NUMBER (NON-KEY NAME X(8) IN 1000)
   1008*  LD50 MODE (NAME XXX IN 1000)
   1009*  LD50 SPECIES (NAME XXX IN 1000)
   1011*  LD50 UNITS (NAME X(10) IN 1000)
   1012*  LCL0 MODE (NAME XXX IN 1000)
   1013*  LCL0 SPECIES (NAME XXX IN 1000)
   1015*  LCL0 UNITS (NAME X(10) IN 1000)
   1016*  AQTX-TLM96-FROM (NON-KEY NAME X(8) IN 1000)
   1017*  AQTX-TLM96-TO (NON-KEY NAME X(8) IN 1000)
   1018*  TLV (NON-KEY NAME X(10) IN 1000)
   1019*  TLV UNITS (NAME X(10) IN 1000)
   1020*  L-A-ING (NON-KEY NAME X IN 1000)
   1021*  L-A-INH (NON-KEY INTEGER NUMBER 9 IN 1000)
   1022*  L-A-IRR (NON-KEY INTEGER NUMBER 9 IN 1000)
   1023*  L-A-SKIN (NON-KEY INTEGER NUMBER 9 IN 1000)
   1024*  L-A-ALL (NON-KEY INTEGER NUMBER 9 IN 1000)
   1025*  L-C-ING (NON-KEY INTEGER NUMBER 9 IN 1000)
   1026*  L-C-INH (NON-KEY INTEGER NUMBER 9 IN 1000)
   1027*  L-C-IRR (NON-KEY INTEGER NUMBER 9 IN 1000)
   1028*  L-C-SKIN (NON-KEY INTEGER NUMBER 9 IN 1000)
   1029*  L-C-ALL (NON-KEY INTEGER NUMBER 9 IN 1000)
   1030*  S-A-ING (NON-KEY INTEGER NUMBER 9 IN 1000)
   1031*  S-A-INH (NON-KEY INTEGER NUMBER 9 IN 1000)
   1032*  S-A-IRR (NON-KEY INTEGER NUMBER 9 IN 1000)
   1033*  S-A-SKIN (NON-KEY INTEGER NUMBER 9 IN 1000)
   1034*  S-A-ALL (NON-KEY INTEGER NUMBER 9 IN 1000)
   1035*  S-C-ING (NON-KEY INTEGER NUMBER 9 IN 1000)
   1036*  S-C-INH (NON-KEY INTEGER NUMBER 9 IN 1000)
   1037*  S-C-IRR (NON-KEY INTEGER NUMBER 9 IN 1000)
   1038*  S-C-SKIN (NON-KEY INTEGER NUMBER 9 IN 1000)
   1039*  S-C-ALL (NON-KEY INTEGER NUMBER 9 IN 1000)
   1010*  LD50 AMOUNT (NON-KEY DECIMAL NUMBER 9(8).999 IN 1000)
   1014*  LCL0 AMOUNT (NON-KEY DECIMAL NUMBER 9(8).999 IN 1000)
   1100*  ANNUAL PRODUCTION DATA (RG IN 1000)
     1101*  PRODUCTION YEAR (INTEGER NUMBER 99 IN 1100)
     1102*  PRODUCTION VOLUME (NON-KEY DECIMAL NUMBER 9(5).999 IN 1100)

     1103*  UNIT COST (NON-KEY DECIMAL NUMBER 9(5).999 IN 1100)
     1104*  SALES (NON-KEY MONEY 99(5).999 IN 1100)
   1200*  END USES (RG IN 1000)
     1201*  END USE DESCRIPTION (NAME X(50) IN 1200)
```

(Continued)

```
    1202*  END USE AMOUNT (NON-KEY DECIMAL NUMBER 9(5).999 IN 1200)
    1203*  PERCENT DOMESTIC USE (NON-KEY DECIMAL NUMBER 999.999 IN 120
           0)
    1204*  END USE IPPEU NUMBER (INTEGER NUMBER 999 IN 1200)
  1300*  SYNONYMS (RG IN 1000)
    1301*  SYNONYM (NAME X(40) IN 1300)
  1400*  PROCESS (RG IN 1000)
    1401*  PROCESS ID (INTEGER NUMBER 99 IN 1400)
    1402*  PROCESS ROUTE (NAME X(25) IN 1400)
    1410*  PRODUCERS (RG IN 1400)
      1411*  PLANT ID (INTEGER NUMBER 9(5) IN 1410)
      1412*  PLANT CAPACITY (DECIMAL NUMBER 9(8).999 IN 1410)
    1420*  PROCESS IPPEU NUMBERS (RG IN 1400)
      1421*  PROCESS IPPEU NUMBER (INTEGER NUMBER 999 IN 1420)
    1430*  PROCESS MODULES (RG IN 1400)
      1431*  MODULE ID (INTEGER NUMBER 9(5) IN 1430)
      1432*  MODULE DESCRIPTION (NAME X(25) IN 1430)
    1440*  EMISSIONS FACTOR (RG IN 1400)
      1441*  EMISSION DESCRIPTION (NAME X(10) IN 1440)
      1442*  EMISSION RATING (NAME X IN 1440)
      1443*  EMISSION AMOUNT (NON-KEY DECIMAL NUMBER 9999.9(6) IN 1440
             )
2000*  PRODUCER DESCRIPTION (RG)
  2001*  COMPANY (NAME X(25) IN 2000)
  2003*  CITY (NAME X(20) IN 2000)
  2004*  STATE (NAME X(10) IN 2000)
  2005*  STATE CODE (NAME XX IN 2000)
  2006*  EPA REGION (INTEGER NUMBER 99 IN 2000)
  2007*  RIVER BASIN (NAME X(30) IN 2000)
  2008*  RIVER BASIN CODE (INTEGER NUMBER 9(8) IN 2000)
  2100*  PARENT COMPANIES (RG IN 2000)
    2101*  PARENT COMPANY (NAME X(25) IN 2100)
---
DESCRIBE STRINGS)
 3014*  LIST STATE (STRING (*LIST PLANT* WH C2005 EQ *1*)))
 3005*  LIST PLANT (STRING (LIST/TITLE R(5)PLANT+ID,L(25)+COMPANY,L(25)
        +CITY,R(5)+STATE/C2,C2001,C2003,C2005,OB C2))
 3004*  PRODUCT SLATE (STRING (LIST/REPEAT SUPPRESS,TITLE R(4)ID,L(2),
        L(30)CHEMICAL,L(35)PROCESS,R(10)CAPACITY/C2,C1401,C1001,C1402,C
        1412,OB C2,C1401 WH C1410 HAS C1411 EQ *1*)))
 4000*  ADD END USE (STRING (APPEND TREE C1200 EQ 1201**2**END* WHERE A
        LL   OF (C1 EQ 1*, C2 EQ *1**))))
 4001*  ADD END USE AMOUNT (STRING (APPEND TREE C1200 EQ 1201**2**1202*
        * 3**END* WHERE ALL OF (C1 EQ 1*, C2 EQ *1**))))
 4002*  ADD END USE PERCENT (STRING (APPEND TREE C1200 EQ 1201**2**1203
        **3**END* WHERE ALL OF (C1 EQ 1*, C2 EQ *1**))))
 4003*  ADD END USE IPPEU (STRING (APPEND TREE C1200 EQ 1201**2**1204**
        3 **END* WHERE ALL OF (C1 EQ 1*, C2 EQ *1**))))
 4004*  ADD END USE DATA (STRING (APPEND TREE C1200 EQ 1201**2**1202**3
        **1203**4**END* WHERE ALL OF (C1 EQ 1*, C2 EQ *1**))))
 4005*  ADD PROCESS (STRING (APPEND TREE C1400 EQ 1401**2**1402**3**END
        *  WHERE ALL OF (C1 EQ 1*, C2 EQ *1**))))
 4009*  MAKERS (STRING (PR/REPEAT SUPPRESS/C2,C1001,C1401,C1402,C1411 W
        H C2 EQ  *1*)))
 4010*  PLANT (STRING (PR/REPEAT SUPPRESS/C2,C2001,C2003,C2005 WH C2 EQ
         *1*)))
 4011*  DESCRIBE CHEMICAL (STRING (PRINT/NAME/C0 WH C2 EQ *1* AND C1 EQ
         1)))
 4020*  ADD END DATA (STRING (APPEND TREE C1200 EQ 1201**2**1202**3**12
        03**4**1204**5**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**))))
```

(Continued)

```
4021* ADD DOM IPPEU (STRING (APPEND TREE C1200 EQ 1201**2**1203**3**1
      204 **4**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**)}))
4022* ADD END USE DOM (STRING (APPEND TREE C1200 EQ 1201 **2**1203**3
      **END* WHERE ALL OF (C1 EQ 1*,C2 EQ*1**)}))
4023* ADD PROD DATA (STRING (APPEND TREE C1100 EQ 1101**2**1102**3**
      1103**4**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**)}))
4016* ADD PRODUCTION (STRING (APPEND TREE C1100 EQ 1101**2**1102**3**
      1103**4**1104**5**END* WHERE ALL OF(C1 EQ 1*,C2 EQ *1**)}))
4030* REMOVE END USE TREE (STRING (REMOVE TREE C1200 WHERE ALL OF (C1
       EQ 1*, C2 EQ *1**)}))
4031* REMOVE WLN (STRING (REMOVE C1006 WHERE ALL OF (C1 EQ 1*, C2 EQ
      *1**)}))
4032* ADD SYNONYM (STRING (APPEND TREE C1300 EQ 1301**2**END*WHERE AL
      L OF (C1 EQ 1*,C2 EQ *1**)}))
4038* CHANGE END USE DESC (STRING (CHANGE C1200 EQ 1201**2**END* WHER
      E ALL OF (C2 EQ *1**,C1201 EQ *3**)}))
4037* ADD PRODUCER DATA (STRING (APPEND TREE C1410 EQ 1411**2**1412**
      3**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**,C1401 EQ *4**)}))
4043* CHANGE WLN (STRING (ASSIGN C1006 EQ *2** WHERE ALL OF   (C1 EQ
      1*,C2 EQ *1**)}))
4046* CHANGE PROD DATA INFO (STRING (ASSIGN C1100 EQ 1101**2**1102**3
      **1103**4**1104**5**END*  WHERE ALL OF (C2 EQ *1**, C1101 EQ *6
      **)}))
4033* ADD AMT TO PROD DATA (STRING (ADD C1102 EQ *3** WHERE ALL OF (C
      2 EQ *1**,C1101 EQ *2**)}))
4034* ADD CAPACITY TO PRODUCER (STRING (ADD C1412 EQ *3** WHERE ALL O
      F (C2 EQ *1**,C1411 EQ *2**,C1401 EQ *4**)}))
4035* ADD END USG* AMT TO END DATA (STRING (ADD C1202 EQ *3** WHERE A
      LL OF (C2 EQ *1**,C1201 EQ *2**)}))
3012* PUT VOLUME IN (STRING (ADD C1102 EQ *3** WHERE ALL OF  (C2 EQ *
      1**,C1101 EQ *2**)}))
3011* ADD SALES TO*PROD DATA (STRING (ADD C1104 EQ *3** WHERE ALL OF
      (C2 EQ *1**,C1101 EQ *2**)}))
3030* CHANGE VOL OF PROD DATA (STRING (ASSIGN C1102 EQ *3**  WHERE AL
      L OF (C2 EQ *1**, C1101 EQ *2**)}))
4007* ADD PROD YR & UNIT COST (STRING (APPEND TREE C1100 EQ 1101**2**
      1103**3**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**)}))
4006* ADD PROD YEAR & VOLUME (STRING (APPEND TREE C1100 EQ 1101**2**1
      102 **3**END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**)}))
4008* ADD YEAR & SALES (STRING (APPEND TREE C1100 EQ 1101**2**1104**3
      **END* WHERE ALL OF (C1 EQ 1*,C2 EQ *1**)}))
3224* ADD UNIT COST TO PROD (STRING (ADD C1103 EQ*3**  WHERE ALL OF (
      C2 EQ  *1**,C1101 EQ *2**)}))
3226* ADD YEAR VOLUME & SALES (STRING (APPEND TREE C1100 EQ 1101**2**
      1102**3**1104**4**END*   WHERE ALL OF (C1 EQ 1*,C2 EQ *1**)}))
3227* ADD IPPEU TO END USE (STRING (ADD C1204 EQ *3**   WHERE ALL OF
      (C2 EQ *1**,C1201 EQ *2**)}))
3228* REMOVE ONE END USE (STRING (REMOVE TREE C1200   WHERE ALL OF (C
      2 EQ *1**,C1201 EQ *2**)}))
4036* ADD PERCENT DOM TO END DATA (STRING (ADD C1203 EQ *3**  WHERE A
      LL OF (C2 EQ *1**,C1201 EQ *2**)}))
4045* CHANGE PROD DATA EXCEPT YEAR (STRING (CHANGE C1100 EQ 1101**2**
      1102**3**1103**4**1104**5**END*  WHERE ALL OF (C2 EQ *1**,C1101
       EQ *2**)}))
3200* CHANGE PLANT NAME (STRING (ASSIGN C2001 EQ *2**  WHERE ALL OF (
      C1 EQ 2*, C2 EQ *1**)}))
3202* CHANGE STATE (STRING (ASSIGN C2004 EQ *2**   WHERE ALL OF (C1 E
      Q 2*, C2 EQ *1**)}))
3203* CHANGE STATE CODE (STRING (ASSIGN C2005 EQ *2**  WHERE ALL OF (
      C1 EQ 2*, C2 EQ *1**)}))
```

(Continued)

```
3223* CHANGE PROCESS (STRING (CHANGE C1400 EQ 1401**3**1402**4**END*
  WHERE ALL OF (C2 EQ *1**,C1401 EQ *2**)}))
3225* ADD YEAR UNIT & SALES (STRING (APPEND TREE C1100 EQ 1101**2**11
  03**3**1104**4**END*   WHERE ALL OF (C1 EQ 1*,C2 EQ *1**)}))
3201* CHANGE CITY (STRING (ASSIGN C2003 EQ *2**  WHERE ALL OF (C1 EQ
  2*, C2 EQ *1**)}))
3221* ADD PARENT COMPANY (STRING (APPEND TREE C2100 EQ 2101**2**END*
  WHERE ALL OF (C1 EQ 2*,C2 EQ *1**)}))
4024* ADD PRODUCT (STRING (APPEND TREE C1410 EQ 1411**3**END* WHERE A
  LL OF (C1 EQ 1*,C2 EQ *1**,C1401 EQ *2**)}))
3229* ADD PRODUCT DATA (STRING (APPEND TREE C1410 EQ 1411**2** 1412**
  3**END* WHERE ALL OF(C1 EQ 1*,C2 EQ *1**,C1401 EQ *4**)}))
3040* CHANGE CAPACITY (STRING (ASSIGN C1410 EQ 1411**2**1412**3**END*
  WHERE ALL OF (C2 EQ *1**,C1411 EQ *2**,C1401 EQ *4**)}))
3211* DELETE PRODUCT (STRING (REMOVE TREE C1410   WHERE ALL OF (C2 EQ
  *1**,C1401 EQ *2**,C1411 EQ *3**)}))
3220* CHANGE PARENT COMPANY (STRING (CHANGE C2101 EQ *3**   WHERE ALL
  OF (C1 EQ 2*,C2 EQ *1**,C2101 EQ *2**)}))
3222* REMOVE PARENT COMPANY (STRING (REMOVE TREE C2100  WHERE ALL OF
  (C2 EQ *1**,C2101 EQ *2**)}))
2500* CHANGE PROCESS DESC (STRING (ASSIGN C1402 EQ *3**  WHERE ALL OF
  (C2 EQ *1**,C1401 EQ *2**)}))
2501* CHANGE CAS (STRING (ASSIGN C1002 EQ *2** WHERE ALL  OF (C1 EQ 1
  *,C2 EQ *1**)}))
2502* CHANGE CONFIDENTIAL FLAG (STRING (ASSIGN C1004 EQ *2**  WHERE A
  LL OF (C1 EQ 1*,C2 EQ *1**)}))
2503* CHANGE POLLUTANT FLAG (STRING (ASSIGN C1005 EQ *2**  WHERE ALL
  OF (C1 EQ 1*,C2 EQ *1**)}))
2504* CHANGE NIOSH (STRING (ASSIGN C1007 EQ *2** WHERE ALL  OF (C1 EQ
  1*,C2 EQ *1**)}))
2505* CHANGE CHEM-NAME (STRING (ASSIGN C1001 EQ *2** WHERE ALL OF (C1
  EQ 1*,C2 EQ *1**)}))
2506* CHANGE RIVER BASIN (STRING (ASSIGN C2007 EQ *2**   WHERE ALL OF
  (C1 EQ 2*,C2 EQ *1**)} ASSIGN C2008 EQ *3** WHERE ALL  OF (C1
  EQ 2*, C2 EQ *1**)}))
2518* ASSIGN TLV (STRING (ASSIGN C1018 EQ *2** WHERE ALL OF   (C1 EQ
  1*,C2 EQ *1**)}))
2515* ASSIGN TLV UNITS (STRING (ASSIGN C1019 EQ *2** WHERE  ALL OF (C
  1 EQ 1*,C2 EQ *1**)}))
2516* ASSIGN AQTX-TLM96-FROM (STRING (ASSIGN C1016 EQ *2**  WHERE ALL
  OF (C1 EQ 1*,C2 EQ *1**)}))
2517* ASSIGN AQTX-TLM96-TO (STRING (ASSIGN C1017 EQ *2**  WHERE ALL O
  F (C1 EQ 1*,C2 EQ *1**)}))
2615* REMOVE PROD DATA TREE (STRING (REMOVE TREE C1100 WHERE ALL OF (
  C2 EQ *1**, C1101 EQ *2**)}))
2616* REMOVE SYNONYM (STRING (REMOVE TREE C1300   WHERE ALL OF (C2 EQ
  *1**, C1301 EQ *2**)}))
2617* REMOVE PROCESS IPPEU (STRING (REMOVE TREE C1420   WHERE ALL OF
  (C2 EQ *1**, C1401 EQ *2**)}))
2618* REMOVE EMISSION TREE (STRING (REMOVE TREE C1440  WHERE ALL OF (
  C2 EQ *1**, C1441 EQ *2**, C1401 EQ *3**)}))
2619* REMOVE EMISSION RATING (STRING (REMOVE C1442   WHERE ALL OF (C2
  EQ *1**, C1441 EQ *2**, C1401 EQ *3**)}))
2620* REMOVE EMISSION AMOUNT (STRING (REMOVE C1443   WHERE ALL OF (C2
  EQ *1**, C1441 EQ *2**, C1401 EQ *3**)}))
2621* REMOVE PROCESS (STRING (REMOVE TREE C1400  WHERE ALL OF (C2 EQ
  *1**, C1401 EQ *2**)}))
2507* ASSIGN LD50 (STRING (ASSIGN C1008 EQ*2** WHERE ALL OF  (C1 EQ 1
  *,C2 EQ*1**)}ASSIGN C1009 EQ*3** WHERE ALL OF (C1 EQ 1*,C2 EQ*1
  **)} ASSIGN C1010 EQ*4** WHERE ALL OF(C1 EQ 1*,C2 EQ*1**)}ASSIG
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(Continued)

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      N C1011 EQ*5** WHERE ALL OF (C1 EQ 1*,C2 EQ*1**)}))
2509* ASSIGN LCL0 (STRING (ASSIGN C1012 EQ*2** WHERE ALL OF (C1 EQ 1*
      ,C2 EQ*1**)}ASSIGN C1013 EQ*3** WHERE ALL OF(C1 EQ 1*,C2 EQ*1**
      )}ASSIGN C1014 EQ*4**WHERE ALL OF(C1 EQ 1*,C2 EQ*1**)}ASSIGN C1
      015 EQ*5** WHERE ALL OF(C1 EQ 1*,C2 EQ*1**)}))
2600* REMOVE CAPACITY (STRING (REMOVE C1412 WHERE ALL OF(C2 EQ*1**,C1
      401 EQ *2**,C1411 EQ*3**)}))
2510* ASSIGN LOCAL ACUTE (STRING (ASSIGN C1020 EQ*2** WH C1 EQ 1 AND
      C2 EQ*1*}ASSIGN C1021 EQ*3** WH SAME}ASSIGN C1022 EQ*4** WH SAM
      E}ASSIGN  C1023 EQ*5** WH SAME}ASSIGN C1024 EQ*6** WH SAME}))
3300* CHANGE UNIT COST & YEAR (STRING (ASSIGN C1103 EQ *3** WH C1 EQ
      1 AND C2 EQ*1* AND C1101 EQ*2*} ASSIGN C1101 EQ*4** WH SAME}))
2508* CHANGE PLANT PROCESS (STRING (REMOVE TREE C1410 WHERE ALL OF(C2
       EQ*1**,C1411 EQ*2**,C1401 EQ*4**,C1 EQ 1*)}ASSIGN C1410 EQ  14
      11**2**1412**3**END* WHERE ALL OF(C1 EQ 1*,C1401 EQ*5**,C2 EQ*1
      **)}))
3212* DELETE PRODUCER (STRING (REMOVE TREE ENTRY WHERE ALL OF  (C1 EQ
       2*,C2 EQ*1**)}))
2601* REMOVE CHEMICAL (STRING (REMOVE TREE ENTRY WHERE ALL OF  (C1 EQ
       1*,C2 EQ*1**)}))
2602* REMOVE CAS (STRING (REMOVE C1002 WH C2 EQ *1*}))
2603* REMOVE NEWFLAG (STRING (REMOVE C1003 WH C2 EQ*1* AND C1 EQ 1}))

2604* REMOVE CONFIDENTIAL FLAG (STRING (REMOVE C1004 WH C1 EQ 1 AND C
      2 EQ*1*}))
2605* REMOVE PRIORITY POLLUTANT (STRING (REMOVE C1005 WH C1 EQ 1 AND
       C2 EQ*1*}))
2606* REMOVE NIOSH (STRING (REMOVE C1007 WH C1 EQ 1 AND C2 EQ*1*}))
2607* REMOVE AQTX-TLM96-FROM (STRING (REMOVE C1016 WH C1 EQ 1 AND C2
      EQ*1*}))
2608* REMOVE AQTX-TLM96-TO (STRING (REMOVE C1017 WH C1 EQ 1 AND C2 EQ
      *1*}))
2511* ASSIGN LOCAL CHRONIC (STRING (ASSIGN C1025 EQ*2** WH C1 EQ 1 AN
      D  C2 EQ*1*}ASSIGN C1026 EQ*3** WH SAME}ASSIGN C1027 EQ*4** WH
      SAME}  ASSIGN C1028 EQ*5** WH SAME}ASSIGN C1029 EQ*6** WH SAME}
      ))
2609* REMOVE LD50 DATA (STRING (REMOVE C1008 WH C2 EQ*1* AND C1 EQ 1}
       REMOVE C1009 WH SAME}REMOVE C1010 WH SAME}REMOVE C1011 WH SAME
      }))
2610* REMOVE LCL0 DATA (STRING (REMOVE C1012 WH C1 EQ 1 AND C2 EQ*1*}
       REMOVE C1013 WH SAME}REMOVE C1014 WH SAME}REMOVE C1015 WH SAME
      }))
2611* REMOVE LOCAL ACUTE DATA (STRING (REMOVE C1020 WH C1 EQ 1 AND C2
       EQ*1*}REMOVE C1021 WH SAME}REMOVE C1022 WH SAME}REMOVE C1023 W
      H SAME} REMOVE C1024 WH SAME}))
2612* REMOVE LOCAL CHRONIC DATA (STRING (REMOVE C1025 WH C1 EQ 1 AND
      C2 EQ*1*} REMOVE C1026 WH SAME}REMOVE C1027 WH SAME}REMOVE C102
      8 WH SAME} REMOVE C1029 WH SAME}))
2613* REMOVE SYSTEMIC ACUTE DATA (STRING (REMOVE C1030 WH C1 EQ 1 AND
       C2 EQ*1*} REMOVE C1031 WH SAME}REMOVE C1032 WH SAME}REMOVE C10
      33 WH SAME}  REMOVE C1034 WH SAME}))
2614* REMOVE SYSTEMIC CHRONIC DATA (STRING (REMOVE C1035 WH C1 EQ 1 A
      ND C2 EQ*1*}  REMOVE C1036 WH SAME}REMOVE C1037 WH SAME}REMOVE
      C1038 WH SAME}  REMOVE C1039 WH SAME}))
2512* ASSIGN SYSTEMIC ACUTE (STRING (ASSIGN C1030 EQ*2** WH C1 EQ 1
      AND C2 EQ*1*}ASSIGN C1031 EQ*3** WH SAME}ASSIGN C1032 EQ*4** WH
         SAME}ASSIGN C1033 EQ*5** WH SAME}ASSIGN C1034 EQ*6** WH SAME
      }))
2513* ASSIGN SYSTEMIC CHRONIC (STRING (ASSIGN C1035 EQ*2** WH C1 EQ 1
        AND C2 EQ*1*}ASSIGN C1036 EQ*3** WH NAME}ASSIGN C1037 EQ*4**
        WH   SAME}ASSIGN C1038 EQ*5** WH SAME}ASSIGN C1039 EQ*6** WH SA
        ME}))

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EXIT}
-506-   CLOSED     CPDB                        92  1249 80/05/21. 12.01.18.
80/12/17. 10.31.38. END   SYSTEM 2000  VERSION 2.70D
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